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ஆண்ட றிக்கை
ANNUAL REPORT

2021

පොල් පර්යේෂණ ආයතනය
தென்னை ஆராய்ச்சி நிறுவகம்
Coconut Research Institute

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

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

වැවිලි අමාත්‍යාංශය
பெருந்தோட்ட அமைச்சு
Ministry of Plantation

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Our **Vision**

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

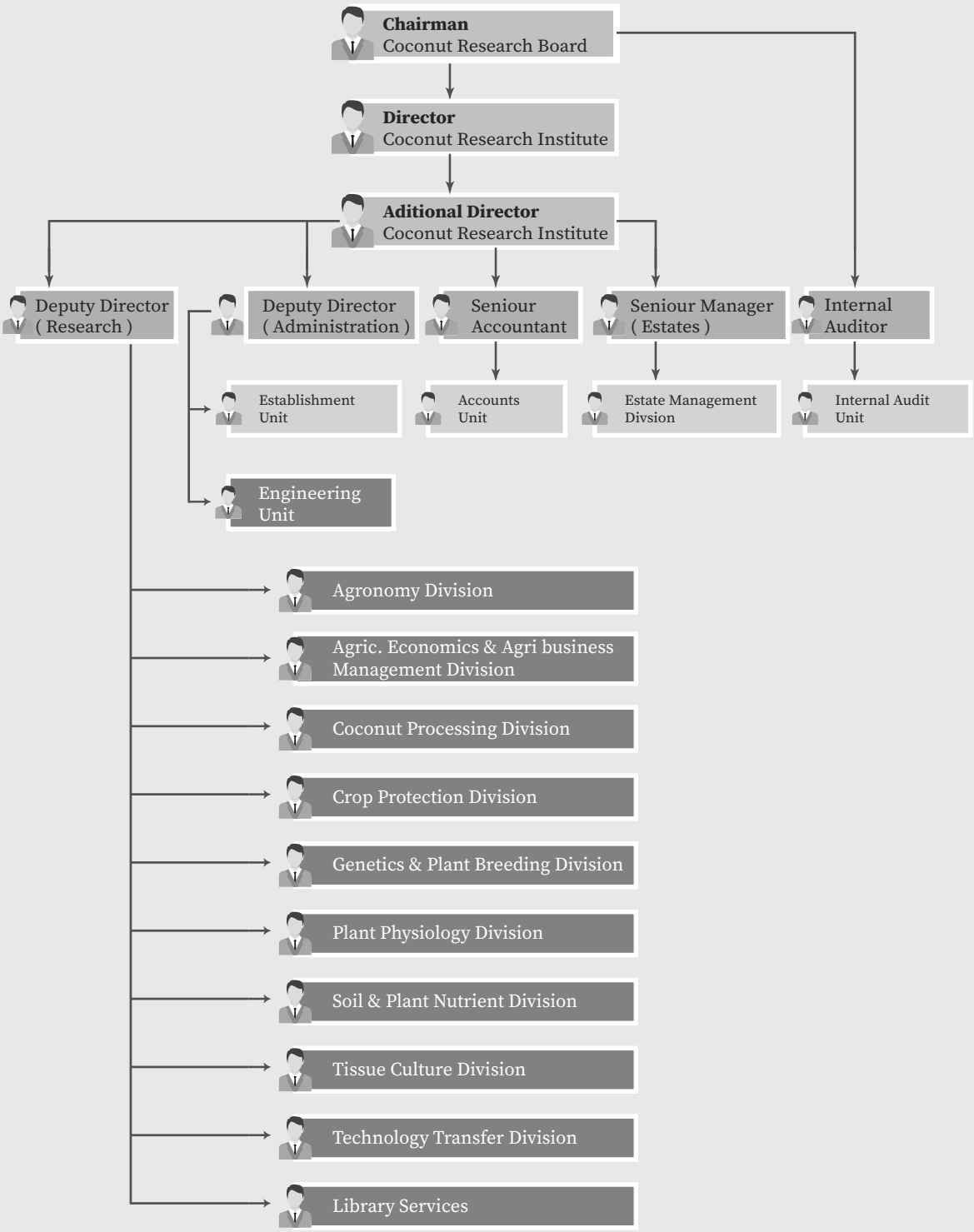
Our **Mission**

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 institute's 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.

ORGANOGRAMME OF THE INSTITUTE



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

THE COCONUT RESEARCH INSTITUTE **ANNUAL REPORT - 2021**

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.

Nine meetings were held during the year.

The Members of the Board		Record of Attendance
Mr. Jayantha Wickremasinghe, Chairman / CRB	(Jan - May 2021)	- 5/5
Dr. Saranga Alahapperuma, Chairman / CRB	(Aug - Dec 2021)	- 4/4
Mrs. A.V.K.M Herath, Chairman / CCB		- 1/2
Mr. Keerthi Sri Weerasinghe, Chairman / CDA		- 2/2
Ms. Sureka Attanayake / Ministry Representative	(Jan - May 2021)	- 5/5
Ms. D.S Wijesekera / Ministry Representative	(Aug - Sep 2021)	- 2/2
Ms. K Karunasena / Ministry Representative	(Nov - Dec 2021)	- 2/2
Dr. W.M.W Weerakoon, Director General / DOA	(Jan - May 2021)	- 2/5
Dr. S.H.S.A De Silva, Director General / DOA	(Nov - Dec 2021)	- 2/2
Dr. S.F.N Silva, Representative / CGA		- 9/9
Mr. R.A.L Udaya Kumara / Treasury Representative		- 9/9
Mr. Bandula Egodage		- 9/9
Mr. Prabath Wimal Kumara / Dir. Sec / CARP		- 6/9
Mr. Chitral Jayawarna		- 9/9
Dr. (Mrs) Sanathanie Ranasinghe Director / CRI		- 9/9

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

The Audit and Management Committee

Altogether 04 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. R A L Udaya Kumara	4/4
Ministry Representative	Mrs. Sureka N Attanayake	2/4 (Jan-May 2021)
	Mrs. Buddhi T Karunasena	2/4 (Nov-Dec 2021)
Observer from Ministry of Plantation	Mr. A Podiralahamy	2/4
Board member	Dr. S F N Silva	4/4
Observer from AGD	Mrs. R M M S Perera	4/4
Director/CRI	Dr. (Mrs.) Sanathanie Ranasinghe	4/4
Internal Auditor	Mr P W A Fernando	4/4
Convener, CRI/AMC, Additional Director/CRI	Dr. Lalith Perera	4/4

AGD: Auditor General's Department

Chairman's MESSAGE

Coconut industry has reached to the booming stage marking remarkable achievements in coconut production, processing and the research and development over the past few years. Even under pandemic situation in 2021, industry operated successfully with the involvement of Ministry of Plantation Industries Coconut Research Institute, Coconut Development Authority and Coconut Cultivation Board. During the year, annual national coconut production reached the highest value in the recent past recording 3,382 million nuts and earning foreign exchange of Rs. 166 billion (USD million 834). At the same time, the industry fulfilled the local edible coconut demand and part of the coconut oil demand while contributing to 0.7% of the Gross Domestic Production (GDP). I am proud to say that the Coconut Research Institute actively intervened in to the process, while providing crop forecasting data, required technical recommendations on cultivation, management of coconut lands and policy recommendations to manage the industry successfully.

The Coconut Research Institute continued its research program under different disciplines on adoption of technologies for enhancing coconut cultivation, increasing crop production, reducing crop losses by protecting coconut palms, developing or improving products and processes to compete with the global coconut processing industries and improving the performance of the coconut sector through proper policies. During the year, Coconut Research Institute issued two new recommendations, namely organic fertilizer recommendation to supplement the inorganic fertilizer requirement and the use of bio-char for soil quality enhancement and soil conditioning.

While identifying the importance of disseminating the technologies developed by the Coconut Research Institute, it used the new tools and approaches to transfer technologies to stakeholders. To fulfill this objective, the Coconut Research Institute upgraded its web site, introduced a hot line 1928 and a dedicated WhatsApp number 0704001928 and used the electronic media, to disseminate the technologies it has developed and to attend the queries of the stakeholders. The Coconut Technology books with QR codes linking relevant videos were printed and distributed to the stakeholders. In addition, the Coconut Research Institute introduced the new Ceylon Coconut Logo with the intention of increasing the recognition of Sri Lanka coconut in the international market. Increasing the production of high yielding hybrid plants has become an urgent need to cater the demand of hybrid seedlings. In this respect, in 2021 establishment of a new hybrid seed garden was initiated jointly with Kurunegala Plantations Pvt. Ltd. Further, 1000 mother palms were selected to produce hybrid seed nuts and a Memorandum of Understanding was signed with Kurunegala Plantations Pvt. Ltd. to produce hand pollinated seed nuts.

The Coconut Research Institute continued the research collaboration with local and global institutes including Universities, National Engineering Institutes, foreign institutes and local and international funding agencies to continue its research program effectively. New knowledge generated through research should be transferred to the end users, the stakeholders and therefore, the Coconut Research Institute continued its research and extension dialogue to transfer the generated knowledge to one of its immediate stakeholders, the Coconut Cultivation Board, and to get the feedback from them, as it is the main technology transfer arm of the industry. While recognizing the Coconut Research Institute as the international knowledge bank of coconut, International Coconut Community (ICC) selected the institute for the third consecutive time to continue "The International Certificate Course for Coconut Development Officers". The Coconut Research Institute successfully completed this program conducting as a virtual training program, since physical programs could not be conducted due to COVID 19 pandemic situation. The scientists from the Coconut Research Institute served as resource persons in many programs, national and international symposia and conferences in the country. I do note here that the Coconut Research Institute is in the process of expanding its knowledge base to cater the local and global coconut industry and for the enhancement of the science.

Dr Saranga Alahapperuma

Chairman

Coconut Research Board

Director's MESSAGE

The coconut sector recorded significant achievements in 2021 with respect to the annual crop yield and export earnings. The country produced the highest ever annual national coconut yield of 3383 Mn nuts and earned the highest ever income of US$ 834 from coconut-related value-added exports. The research recommendations, development activities and services that the CRI provided to the stakeholders have been a valuable input to the success and the development of the coconut industry.

With the introduction of the new government policy of using only organic fertilizer on crops, a fertilizer package including different organic materials was recommended and an interim recommendation on the use of biochar was made for soil quality enhancement 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 bio-char and Municipal Solid Waste (MSW) in coconut plantations, identifying new mulching material, developing / improving the technology for value added coconut products, developing /upgrading machinery used for coir sector and studying the health benefits of coconut oil and sap products was continued satisfactorily. Three Genetic Resources Centres of CRI were maintained satisfactorily and produced 1.3 Mn genetically superior coconut seed nuts for the National replanting programme. A new set of 1000 mother palms were added to the hand pollination program in CRI seed gardens and initiated partnership projects with private sector and Kurunegala Plantation Ltd to increase the hybrid seed nut production. 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. Annual National Coconut Production (ANCP) of 2021 was estimated as 3383 Mn nuts as against the CRI forecast of 3353 Mn nuts and the coconut yield for first 8 months of 2022 was forecast as 2337 Mn nuts.

As technology transfer activities, a new hot line 1928 and new WhatsApp number 070 400 1928 were introduced to provide technical advice and information to stakeholders, the Business Incubation facility continued to provide training and hands-on experience on coconut product development for small and medium scale entrepreneurs, two Research-extension dialogues were conducted between CRI and Coconut Development Officers (CDOs) of the CCB, the certificate course on coconut cultivation and value addition was conducted as on-line program for the stake holders in Sri Lanka, the third "International Certificate Course for Coconut Development Officers" jointly organized by International Coconut Community (ICC) and Coconut Research Institute (CRI) was conducted on-line for 38 international participants from

19 coconut growing countries, series of radio programs were conducted and the Technology Park was successfully maintained. 19 research papers in Science Citation Indexed Journals, 11 research papers in international journals, 03 research papers in local refereed journals, 25 research papers in national and international symposia, 06 book chapters, 03 policy documents and 03 other articles were published in 2021. In addition, 10 commemorative postal stamps on coconut related products and 02 first day covers were released to commemorate World Coconut Day, on 02 nd September.

With respect to policy formulations, policy recommendations on export and import of coconut products and its substitutes and special commodity levy changes of coconut oil and palm oil were submitted to the policy makers and formulae for estimating cost of production of coconut nuts and seedlings were further improved.

During 2021, a total of 5.13 Mn coconuts were produced in the CRI estates (Genetic Resource Centres and Research Stations) and it's a 31% increase compared to the yield of 2020. The average cost of production (COP) of all estates was Rs.27.80 per nut while the Net Sale Average (NSA) was Rs.55.69.

As services to the stake holders, predatory mites for Aceria mite, parasitoids for coconut caterpillar and aggregation pheromones for red weevil were produced and supplied to growers and analytical services for Fertilizer Recommendations and husk-based export products were provided.

Its with great pleasure, the dedicated services, cooperation and support extended by the staff of the CRI towards all these achievements made during 2021 are greatly appreciated. I am grateful to the Hon. Minister, State Minister, Secretaries and the officials of the Plantation Ministry and the State Ministry, Chairman and the Board of Directors for their guidance and support extended to us during the year.

I wish CRI every success.

Dr Sanathanie Ranasinghe

Director

Coconut Research Institute

RESEARCH RECOMMENDATION

New organic fertilizer package

Soils & Plant Nutrition Division

In addition to the fertilizer recommendations already issued by the Coconut Research Institute (organic only, inorganic only and combination of organic & inorganic fertilizer), with the introduction of new government policy of using organic fertilizer only, a fertilizer package including different organic material to cater the demand of the growers was recommended.

Interim recommendation on using biochar

Agronomy Division

Interim recommendation on using biochar for soil quality enhancement and thereby for improving the productivity of coconut plantations was made.

POLICY PROPOSALS

Policy proposal for facilitation of domestic marketing and trade

Agricultural Economics & Agri Business Management Division

According to the prediction, expected national coconut production in year 2021 is 3,300 million nuts which is the highest nut production expected in recent past. Although COVID 19 pandemic situation existed in the country, coconut based product processing factories were operated well while generating significant outputs to the export and local markets. As the result, coconut industry was able to absorb the bumper coconut crop received in 2021. But due to covid 19 situation there were issues related to export products of coconut, because of increasing the port handling chargers, not availability of shipping lines, limiting the importation of packaging materials and also empty containers.

Further, though coconut industry operated in a favorable level, still the national coconut production is not sufficient to produce total oil requirement in the country. According to the CRI estimates, national edible oil requirement and industry demand is around 180,000 MT to 210,000 MT. As per the annual production statistics, local coconut oil production is around 35,000 to 45,000 MT and palm oil production is around 15,000 MT to 20,000 MT. Therefore the practice was the importation of required balance oil quantity to the country as coconut oil, palm oil, sunflower oil and other edible oils. But Government implemented SCL revision from 07 April, 2021. According to this revision, Special Commodity Levy of palm oil and its fractions not refined was banned (HS code 1511-10-00, 1511-90-00, 1511-90-20) and palm oil and its fractions refined were converted to licensed status (HS code: 1511-90-00, 1511-90-10, 30, 90). These restrictions were influenced to limit the importation of edible oil to the country. As the result competition for nuts from coconut oil industry and other processing industries increased drastically resulting nut price increase and coconut oil price increase. Further, coconut oil prices increased drastically in the international market after implementing restriction of importing palm oil to the country. Therefore, to mitigate this situation and minimize the damages to the processing industry CRI proposed the following policy recommendations.

Recommendation 1

Reduce the import taxes of coconut oils by Rs. 50.00 and other edible oils by Rs. 100.00 per kg to manage the edible oil prices around Rs. 500.00 to Rs. 550.00 per kg. As coconut oil prices have increased drastically, it is recommended to promote importing other edible oils to minimize the foreign exchange cost.

Recommendation 2

Temporarily suspend CDA coconut auction to prevent the manipulation of fresh coconut prices in the market

Recommendation 3

Propose to grant concessions for port handling chargers for coconut-based exporters which has increased tremendously.

Recommendation 4

Facilitate to export the hanging containers with the coconut processing industry

Recommendation 5

Relax the import taxes which have been imposed on packaging materials

RESEARCH AND DEVELOPMENT HILIGHTS

COCONUT VARIETAL IMPROVEMENT

Identification and characterization of drought-tolerant coconut genotypes using physiological and gene expression study

Genetics & Plant Breeding Division

Drought is a major stress factor that adversely affects the growth, development, and physiological processes of coconut palm resulting lower nut production. Moreover, it is anticipated that the frequency of drought will be increased especially in tropical regions in future due to climate change. Therefore, breeding for drought tolerance has become a high-priority research area. Coconut Research Institute of Sri Lanka (CRISL) conducted several varietal improvement programmes for drought stress tolerance since 1980's and identified a pool of mother palms as putatively drought tolerant. This mother palm pool was named as Ambakelle special.

However, it is essential to identify the genetic basis of drought tolerance through physio-biochemical and gene expression studies. Therefore, in 2021, a new experiment was initiated to characterize Sri Lanka coconuts through physiological and gene expression studies. This experiment marked the first use of gene expression studies in coconut breeding programme of CRISL. In addition, this experiment will be used to confirm the putative drought-tolerance of the Ambakelle special.

Development of coconut cultivars tolerant to coconut mite

Genetics & Plant Breeding Division

Infestation by the Aceria mite causes crop losses in coconut plantations, especially in the intermediate and dry zones of Sri Lanka. Breeding coconuts for tolerance/resistance to Aceria mite has been identified as one of the sustainable options to reduce the crop loss. Therefore, Genetics and Plant Breeding Division produced five new coconut hybrids namely, Sri Lanka Tall x Brazilian Green Dwarf, Gon thembili Tall x Brazilian Green Dwarf, Brazilian Green Dwarf x Gon thembili Tall, San Ramon Tall x Brazilian Green Dwarf, Sri Lanka Yellow Dwarf x Gon thembili Tall using diverse parents. These

hybrids are being evaluated in the field for the last 12 years.

Fig. 1. Tall x Brazilian Green Dwarf palm

Sri Lankan Tall x Brazilian Green Dwarf (T x BGD) cross was repeatedly showing its superiority in terms of fewer mite incidence and higher nut yield over the years. T x BGD reported the least mite incidence while maintaining a higher nut yield similar to the best nut producer Kapruwana. Therefore, T x BGD has shown a high potential as a mite tolerant coconut cultivar for a future recommendation. Data recording will be continued in the multi-locational trials to obtain comprehensive evidence. At the same time, CRISL is in the process of multiplying the exotic parent variety Brazilian Green Dwarf at the field gene banks.

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

Genetics & Plant Breeding Division

Coconut genetic resources are threatened by high rate of genetic erosion, mainly due to industrialization, urbanization, infrastructure development, changing use of agricultural land for high cash crops, national replanting program which replaces existing coconuts and natural disasters such as cyclones, drought, pests and diseases. Therefore, Genetics and Plant Breeding Division is conducting a programme since 1980's to collect, ex-situ conserve and characterize coconut germplasm in the country.

Table 1.

Variety	No. of seedlings produced
Local germplasm	
Gonthembili	28
Bodiri	35
Ranthembili	78
RathRan thembili	43
Brown dwarf	168
Red dwarf	42
Exotic germplasm	
Cameroon red dwarf	194
Malayan red dwarf	27
Brazilian green dwarf	25
Rennel Island Tall	22
Andaman Tall	19
Catigan green dwarf	7

Local and exotic germplasm multiplied for the conservation in 2021 is shown in Table 1.

Induction of somatic embryogenesis and plant regeneration in ovary derived callus

Tissue Culture Division

Cultures at callus multiplication and shoot initiation stages were treated with higher levels of plant growth regulators (300 µM 2,4-Diclorophenoxyacetic acid and 300 µM 6-Benzylaminopurine respectively) in order to evaluate the possibility of overcoming the low rate of clonal shoot multiplication.

During the period, about 700 shoots were regenerated from cultures initiated from 18 inflorescences. Statistical analysis of experiments could not be performed due to deterioration of considerable amount of calli at different stages due to COVID 19 lockdown.

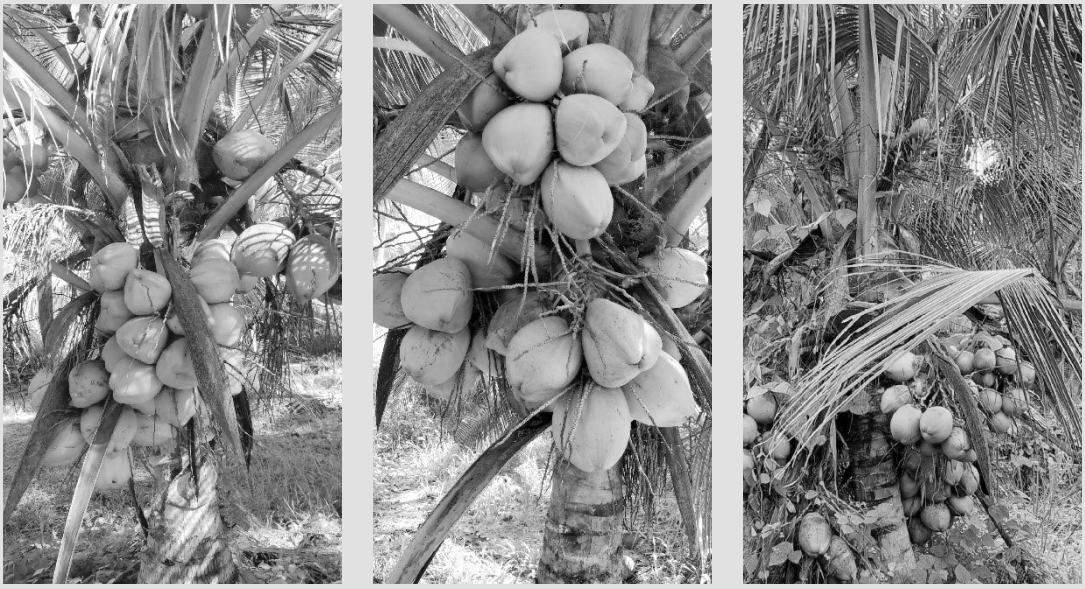


Fig. 2. Ovary cultured clonal palms with fruit bunches

During the year, 85 ovary-derived clonal plants were acclimatized, 20 were field planted. Many ovary cultured clonal palms of CRIC 65 and CRISL 98, which are established at Bandirippuwa Estate and Katana in 2016 -2017, showed good bearing this year.

Identification of new explants for vegetative propagation of coconut

Tissue Culture Division

As new explants for coconut micropropagation, potential of tender leaf tissues was tested by culturing in different media combinations. Leaf sections of in vitro grown embryo cultured plants were used for the experiments in order to develop a protocol for clonal plants derived from ovary calli. Basal leaf tissues were cultured in different media combinations. Few explants produced embryoids and shoots were produced after the germination of embryoids. Generated shoots were maintained in the relevant media for further growth.

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

Agronomy Division

This study was aimed at developing a sustainable soil moisture conservation method using biochar under coconut plantations in dry and intermediate zones of Sri Lanka. The experiment was established in 2015 in a coconut plantation of 30 years old (Fig. 1) in an estate at Rasnayakapura in Puttlam District, representing the dry zone. Biochar was made using Gliricidia sticks inside a modified kiln under minimum supply of oxygen. The following treatments were arranged in Randomized Complete Block Design (RCBD) model with 3 replicates;

Fig. 1. Study Site

1. Burying 15 kg Biochar in 1/3 circular pit
2. Burying 10 kg Biochar in 1/3 circular pit
3. Burying 5kg Biochar in 1/3 circular pit
4. Burying 200-250 coconut husks in 1/3 circular pit
5. Control (mulch with coconut fronds)

The average nut yield data of 5 consecutive years from 2016-2021 are shown in the Fig. 2. The highest yield (69 nuts/palm/year) was observed in the palms that received 15 kg biochar treatment and it was significantly higher from the palms that received coconut husk treatment and the control (57 nuts/palm/year and 53 nuts/palm/year respectively). Compared to the palms that received the coconut husk burying treatment, the yield increase in the palms with the 15kg biochar burying treatment was 21%. There were no significant differences in the soil moisture among the treatments (Fig. 3).

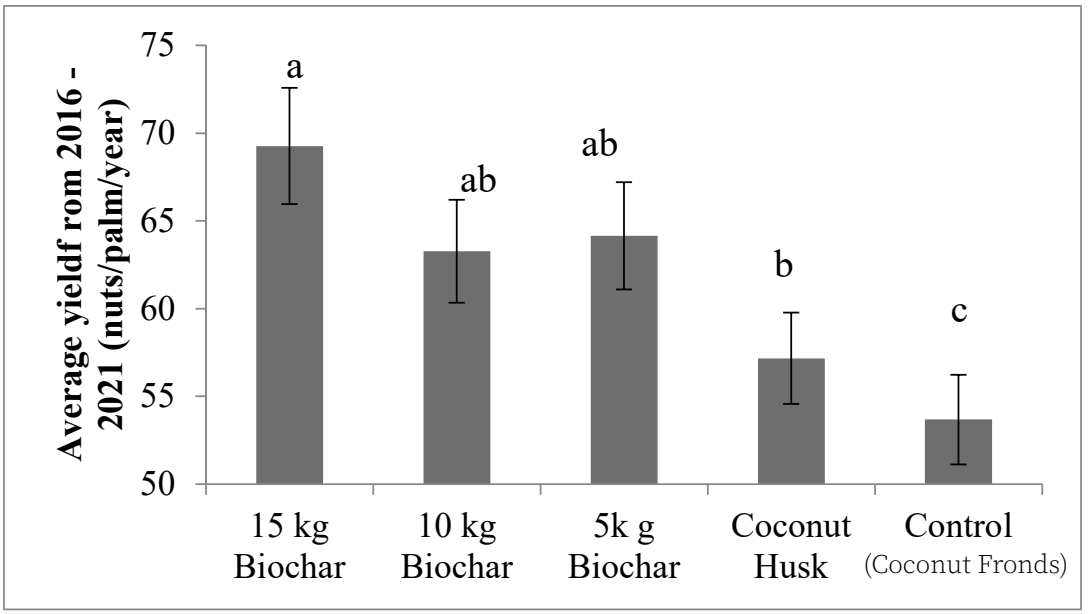


Fig. 2. Average nut yield data from 2016 – 2021 of biochar, coconut husk and control treatments.Columns with the same letter are not significantly different at $p<0.05$.

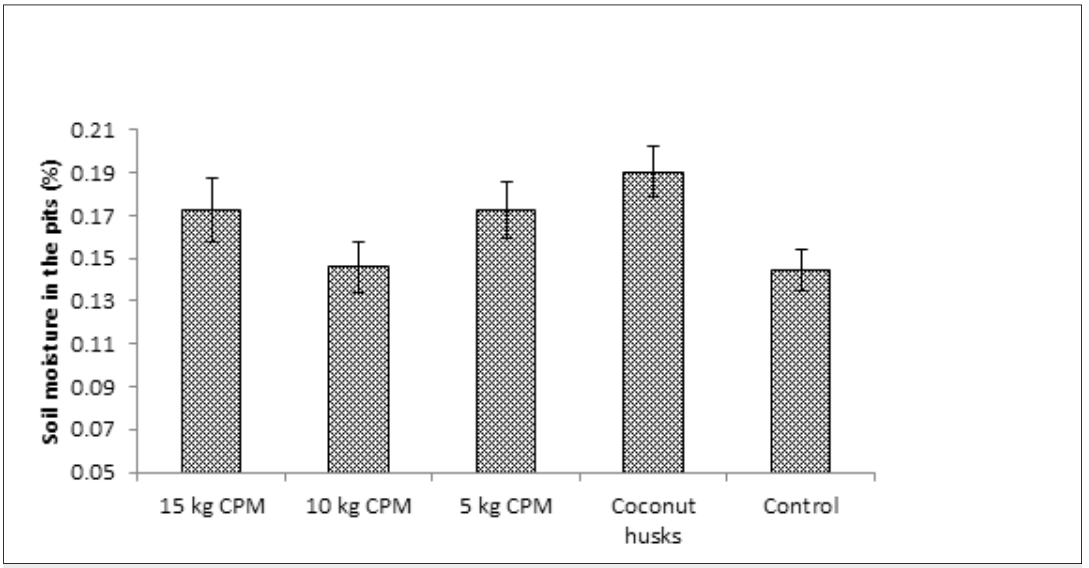


Fig. 3. Soil moisture percentage in the pits that received different treatments

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

Agronomy Division

This study was done to develop a sustainable soil moisture conservation method for coconut seedlings using biochar in Dry and Intermediate Zones and to evaluate the best method of biochar application for coconut seedlings at the time of establishment.

Gliricidia biochar (2 % w/w) was applied in place of coconut husk layers during seedling establishment as a substitute for coconut husk to retain moisture and fertilizer along with reducing seedling mortality due to moisture stress. The following treatments were allocated in RCBD model with three (3) replicates;

T1 - No Biochar or Coconut Husks in the bottom of the pit

T2 - Coconut Husks (30 – 35) placed in the bottom of the pit [Coconut Research Institute (CRI) Recommendation]

T3 - 2 % Gliricidia Wood Biochar (GWB) laid as a layer in the bottom of the pit

T4 - 1 % GWB laid as a layer in the bottom and 1 % GWB incorporated with soil in the pit

T5 - 2 % GWB incorporated with soil in the entire pit

There was no significant difference in soil moisture content between treatments one year after seedling establishment (Table 1).

The highest soil moisture content was observed in T5 (5.86 %) in which the 2 % biochar was mixed with entire soil of the pit which is significantly different from the coconut husk treated pit which had 4.67 % moisture. The wet aggregate stability data showed a similar trend, but they were not significantly different. Under the field condition, the highest wet aggregate stability percentage was observed in T3 and T4 treatments as 21.6 % and 21.4 % respectively. The data were significantly high compared to the husk treated pits (18.6 %).

However, the experiment is continued in 2022 to arrive at firm conclusions.

Fig. 4. Application of biochar in the field

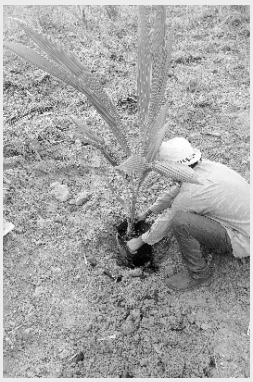


Fig. 5. Planting of seedlings

Fig. 6. Measuring growth parameters

Table 1. Soil moisture content and the wet aggregate stability of the treatments after one year of seedling establishment.

Treatment	Soil moisture %	Wet aggregate stability %
No biochar or coconut husks in the bottom of the pit	5.03 [ab]	19.63 [ab]
Coconut husks (30 – 35) placed in the bottom of the pit (CRI Recommendation)	4.67 [b]	18.63 [b]
2 % Gliricidia wood biochar (GWB) laid as a layer in the bottom of the pit	5.69 [a]	21.60 [a]
1 % GWB laid as a layer in the bottom and 1 % GWB incorporated with soil in the pit	5.40 [ab]	21.42 [a]
2 % GWB incorporated with soil in the entire pit	5.86 [a]	20.06 [ab]
CV	0.31	0.27
P-Value	0.142	0.103

Means that do not share a same letter are significantly different at $p<0.1$.

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

Agronomy Division

In general, coconut is cultivated under rainfed conditions. It requires a regular supply of water to maintain its potential growth and production and therefore, soil moisture stress during dry periods is a crucial factor in survival and the nut production of coconut. Mulching the manure circle of the palms and seedling with different plant materials and husk burial are the common soil moisture conservation methods practiced in coconut plantations. Availability of suitable materials for mulching is becoming scarce as they have high demands as a raw material in many agricultural and industrial products. Therefore, this experiment was designed to evaluate the effect of commercially available modified polythene mulches (mulching mat and mulching film) on the soil moisture conservation and the growth of coconut seedlings compared to conventional mulching materials.

Soil moisture content under different mulching materials (Fig. 7) was measured. The effect of the mulching materials on the soil moisture content of the top soil (0 -15 cm) was significantly different. The highest soil moisture percentage was observed with the coconut fronds as the mulching material (7.22%) and the lowest (5.57%) was observed with the mulching films. The effects of the mulching mat, coconut fronds and coconut husks on the soil moisture content of the top soil was similar. The effects of all the mulching materials on the soil moisture content at the depth of 15 – 30 cm and 30 – 45 cm were the same.

Top soil samples taken from different mulching materials were analyzed for microbial respiration. The results indicated that the effect of the mulching materials on the microbial activity was also the same.

Fig. 7: Mulching film and mulching mat tested in young seedlings

Table 2. Moisture Content and the Microbial Activity under different mulching materials at different depths 1 year after application of treatments

Mulching Material	Moisture % (Dry Basis)			Microbial activity (µg-CO2/g-soil/ day)
	0 - 15 cm	15 - 30 cm	30 -45 cm	
Coconut Fronds	7.22[a]	8.07	7.55	49.63
Coconut Husks	5.96[ab]	7.32	7.85	47.6
Mulching Mat	6.35[ab]	7.38	8.35	47.44
Mulching Film	5.57[b]	7.25	7.82	46.6
SD	1.54	1.04	1.91	18.58
CV	24.49	13.85	24.15	38.87
P-Value	0.01	0.06	0.86	0.973

Means that do not share the same letter are significantly different at $p<0.05$

Investigating the alternative uses of *Panicum maximum* (Guinea Grass)

Agronomy Division

Panicum maximum which was introduced to Sri Lanka in the 1820s as a forage, has naturalized into the ecosystems in the country during the past few decades. Currently, it is considered an invasive problematic weed. Many coconut plantations have been invaded by *P. maximum* disturbing the routine practices of the plantations and thereby increasing the cost of production.

As it is a rhizomatous grass weed, most of the manual and mechanical weed control methods are not effective to manage this weed. With the banning of the systematic herbicides, managing this weed has become very laborious. 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 P. maximum as a raw material to produce compost, vermicompost and cattle feed by estimating the nutrient composition at different harvesting intervals.

Dry matter (DM) content of *P. maximum* is increased with time and the highest DM content (1.89Mt/ha) is shown when harvesting is done at 12 weeks after regrowth. Similarly, Crude Fiber percentage (CF %) is increased with time. The lowest CF % (36.39 %) was recorded at 4 weeks after regrowth and the highest (39.63%) was recorded at 12 weeks of regrowth.

Crude Protein percentage (CP %), N% and P% are reduced with time and the highest values in all three parameters were recorded at 4 weeks after regrowth (Table 3).

*Table 3. DM Content, CP %, CF %, N % and P % of **P. maximum** at different harvesting intervals*

Harvesting Interval (Weeks after Regrowth)	DM (Mt/ha)	CP %	CF %	N %	P %
4	0.84^{b}	9.32^{a}	36.39^{c}	1.49^{a}	0.29^{a}
6	1.01^{b}	7.28^{b}	38.40^{b}	1.16^{b}	0.27^{a}
8	1.52^{ab}	6.82^{bc}	38.62^{ab}	1.09^{bc}	0.25^{abc}
10	1.80^{a}	6.22^{c}	38.38^{b}	0.99^{c}	0.21^{bc}
12	1.89^{a}	4.53^{d}	39.63^{a}	0.71^{d}	0.19^{c}
P-Value	0	0	0	0	0
SD	0.74	1.86	2.08	0.31	0.1
CV	52.53	27.86	5.44	28.92	43.18

Means that do not share the same letter are significantly different at $p<0.05$

Application of Municipal Solid Waste (MSW) for Coconut Plantations

Soils & Plant Nutrition Division

Contamination of compost with heavy metals and pathogens creates a risk to human health. Application of MSW compost into coconut plantations is currently being practiced by the coconut farmers without a recommendation given by the Coconut Research Institute (CRI). A set of samples collected from 30 Municipal Councils

in Sri Lanka was analyzed in order to identify mainly macronutrients, micronutrients, pathogens and heavy metals in MSW compost. The experiments on macronutrients, micronutrients and pathogens were completed in 2020 and the results revealed that macro nutrient contents was low, carbon content was high and micronutrients were in the acceptable range. In 2021, the heavy metals were analysed. The heavy metal levels in the samples (Table 4) were at the acceptable level specified by the Sri Lanka Standard Institution Standards. Mercury was observed only in two samples at detectable level.

Table 4. Heavy Metals observed in MSW compost samples

Heavy Metal	Mean (Range) (mg/kg)	SLSI Standard (mg/kg)
Cadmium (Cd)	0.41 (0.1-1.3)	Max. 3
Chromium (Cr)	20.7 (7.4-63.6)	Max. 150
Lead (Pb)	9.66 (2.9-21.2)	Max. 150
Nickel (Ni)	6.5 (1.28-11.7)	Max. 50
Arsenic (As)	2.4 (0.5-4.2)	Max. 5
Mercury (Hg)	0.2 (0.1-0.3) **	Max. 2

SLSI – Sri Lanka Standard Institution

*** Mercury was observed only in two samples at detectable levels.*

Coliform, fecal coliform, Samonella, live nematodes and viable eggs of nematodes were tested in all the samples. Fecal coliform was in 16 samples at detectable levels. But Salmonella was not observed in any of the samples. Nematodes (5 samples) and viable eggs of nematodes (10 samples) were observed in a few samples at detectable levels. The presence of fecal coliform indicates the contamination of compost with fecal matter. However, the CRI does not recommend application of MSW compost into coconut plantations until the completion of the study, especially on microplastic and carbon fractionation.

Successful optimization of clearing and staining protocol for evaluation of arbuscular mycorrhizal (AM) colonization in field-grown heavily pigmented coconut roots.

Soils and Plant Nutrition Division

Working with heavily pigmented field-grown coconut roots is one of the biggest challenges for the scientists working on the symbiosis between AM fungi and coconut palms. Clearing roots with potassium hydroxide (KOH) followed by staining with trypan blue is a commonly used method to visualize fungal structures in roots. However additional steps are required to ensure clear visualization for dark pigmented roots like coconuts.

Several additional steps such as overnight soaking of root fragments, several cycles of heating of roots in different concentrations of KOH, autoclaving of roots in KOH for different time span and addition of hydrogen peroxide to clear the roots were tested in combinations before staining the roots with Trypan blue after acidification of roots. The combination of overnight soaking in 10% Potassium Hydroxide (KOH) followed by autoclaving, and several cycles of heating of roots fragments at 70^0C with fresh KOH in an oven until the roots became clear (Fig. 8) and translucent without severe damage to the roots enhanced the staining process and visualization of arbuscular mycorrhizal structure under the compound microscope (Fig. 9).

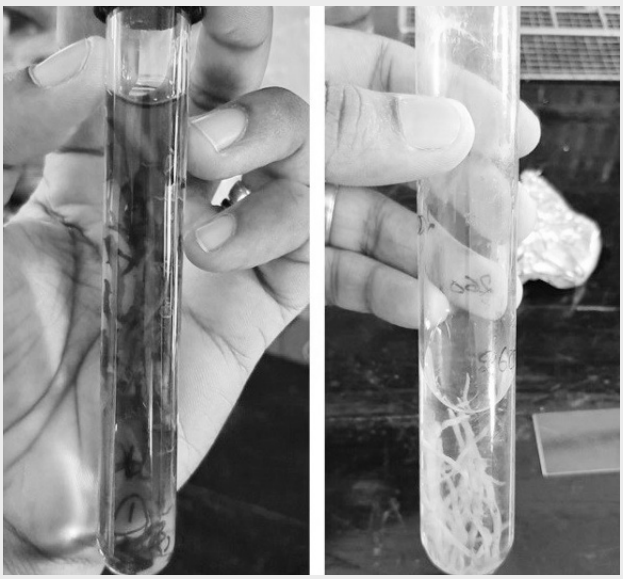


Fig. 8. Heavily Pigmented roots (Left) and successfully cleared coconut roots (Right) with the optimized clearing and staining protocol

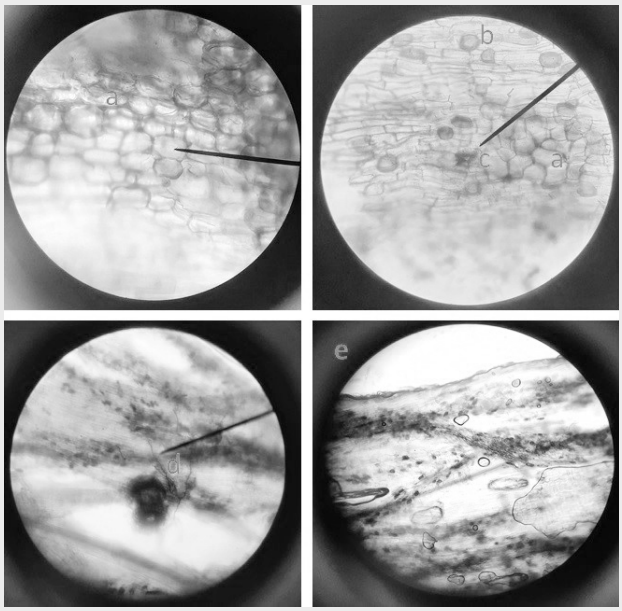


Fig. 9. Arbuscular mycorrhizal structures in heavily pigmented coconut roots after successful clearing and staining. (a) Inter-radical hyphae (b) Vesicles (c) Arbuscules (d) extra-radical hyphae (e) a 70% infection scored root fragment, with Arbuscules and inter-radical hyphal structures.

Biochar as soil conditioner can improve the symbiosis of Vesicular-Arbuscular Mycorrhizae in Coconut Rhizosphere

Soils and Plant Nutrition Division

As a part of the research project on "Biochar as soil conditioner in Coconut plantations: effects on nutrient availability and plant-growth promoting soil biota", a long-term field experiment was commenced in 2018 to study the effect of biochar on beneficial microorganisms in soil. The biochar types used in this experiment were artisanal produced biochar from the farm-based waste materials namely, Gliricidia sticks (GL-BC) and paddy husk. Three years after the biochar application, the effect of biochar application was assessed by the microscopic visualization of roots of coconuts collected from the field trial. The results of the study show that the biochar application has increased the root infection of vesicular-arbuscular mycorrhizae of the coconut roots than the control. However, GL-BC showed a significantly higher infection than the control treatment without biochar amendment. Research is being continued.

Developing non-destructive models to estimate leaf area of split/ partially split fronds of seedlings of three commonly grown coconut cultivars

Plant Physiology Division

The aim of this study was to determine an easy, accurate, cost-effective, and non-destructive formula to estimate leaf area of split or partially split leaves in 1 - 3 years old three commonly grown coconut cultivars; Tall x Tall (TT), Dwarf Green x Tall (DT), and Dwarf Yellow x Tall (DYT). Sixty leaf samples from each cultivar were randomly collected from the nurseries of Coconut Research Institute of Sri Lanka.

Multiple linear regression analysis, polynomial models, and Feed Forward Neural Network (FFNN) approaches were employed in the model development using different variable selection techniques. The result indicated that FFNN with nine – four, seven – two, seven – three, architectures in two hidden neurons have the best performance in predicting leaf area at MSE, 0.1761, 0.1378, and 0.1701 with degree of accuracy 0.91, 0.93, and 0.86 respectively for TT, DYT, and DT varieties. Independent variables for the TT variety were Maximum Length, average length of last leaflets and average width of middle three leaflets. Maximum length, average length of last two leaflets, distance between two tips, average length of the middle three leaflets, and average width of the middle three leaflets were the independent variables for the DYT variety.

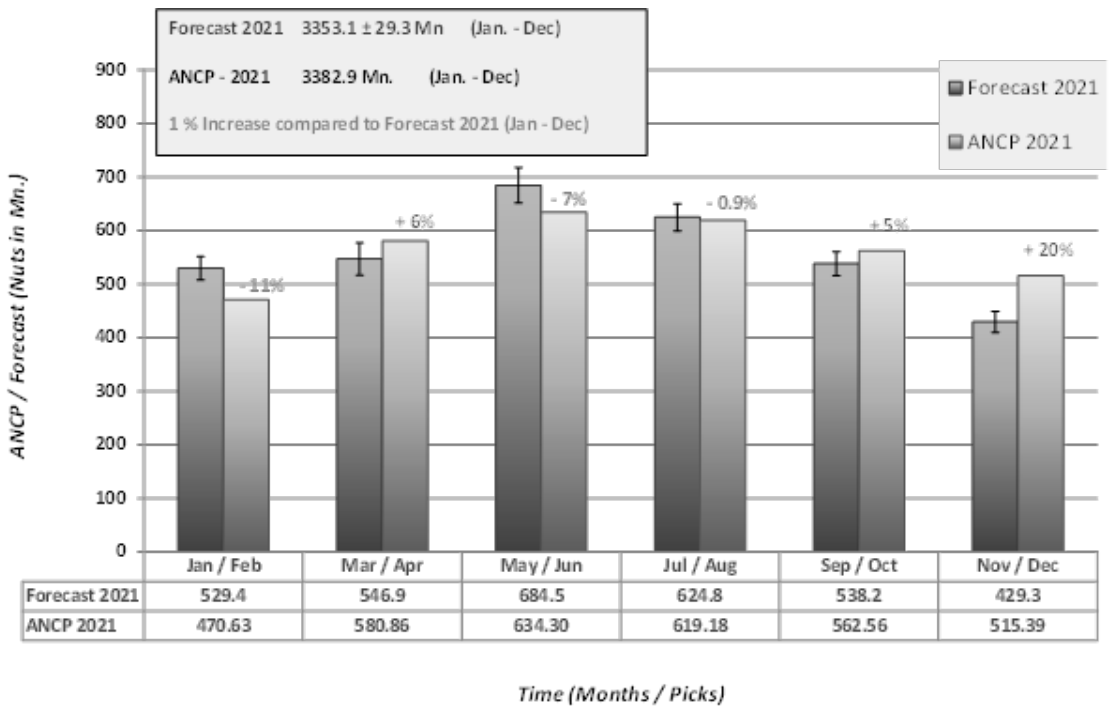
For the DT variety, average width of the middle three leaflets, average length of the middle three leaflets and the number of leaflets were the independent variables. However, as these models are complex to be used in the field, the study continues to further reduce the number of hidden layers in the network architecture, while improving the accuracy.

CLIMATE CHANGE EFFECTS ON COCONUT PRODUCTION

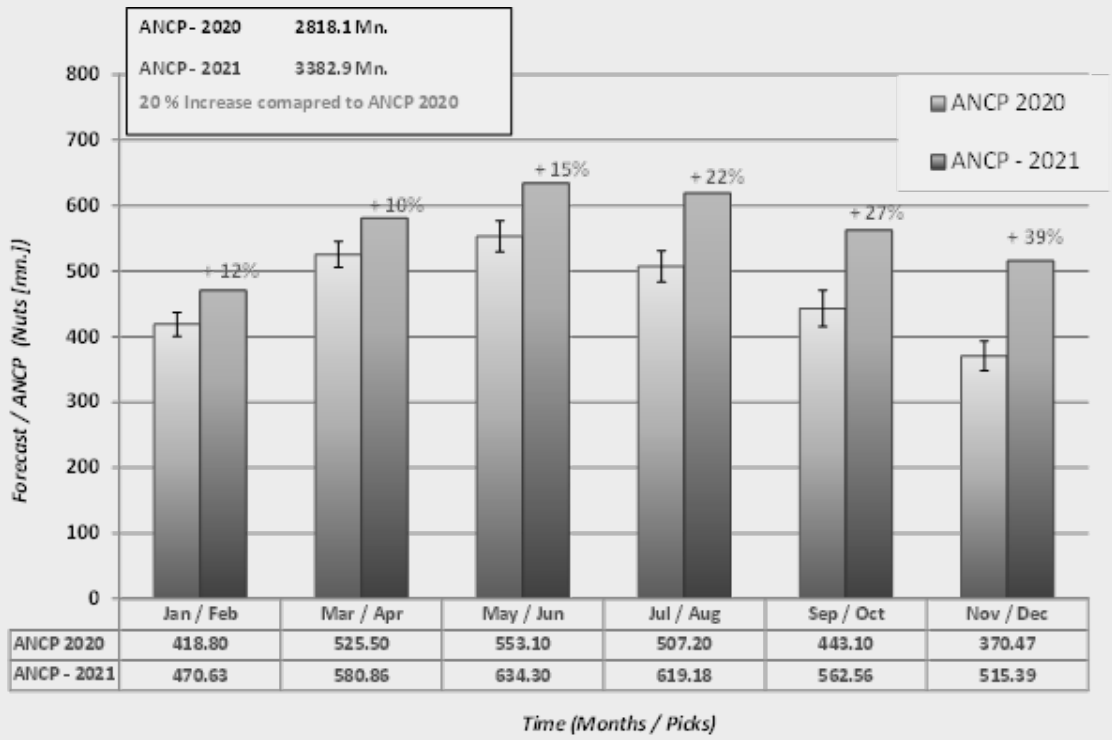
Effect of climatic coconut

Plant Physiology Division

The Annual National Coconut Production (ANCP) for the year 2021 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 3382.9 Mn nuts in 2021 and it was the highest yielding year in the recent past. Accordingly, the production in 2021 was about 20% increase in yield compared to that of 2020 (2818.1 Mn nuts). The pattern of yield variation observed within the year was comparable with the general pattern with the peak in 3rd pick (May/June) (634.3 Mn. Nuts). The estimated ANCP of 2021 was close to the forecast for the year (3353.1 ± 29.3 Mn Nuts) and the production was only 1% higher than the prediction.



	Jan / Feb	Mar / Apr	May / Jun	Jul / Aug	Sep / Oct	Nov / Dec
Forecast 2021	529.4	546.9	684.5	624.8	538.2	429.3
ANCP 2021	470.63	580.86	634.30	619.18	562.56	515.39



	Jan / Feb	Mar / Apr	May / Jun	Jul / Aug	Sep / Oct	Nov / Dec
ANCP 2020	418.80	525.50	553.10	507.20	443.10	370.47
ANCP - 2021	470.63	580.86	634.30	619.18	562.56	515.39

Fig. 1. (a) Comparison of the actual Annual National Coconut Production (ANCP) on bimonthly basis for 2021 with the forecast and (b) its comparison with the ANCP 2020

This higher production in 2021 compared to that of 2020 was well contributed by the high and well-distributed rainfall received in major coconut growing areas in the latter part of 2020 and almost throughout the year 2021. According to the records of rainfall, the average annual rainfall received across all meteorological stations covering all coconut growing districts in 2021 (2268.9 mm) was about 48% higher than that of 2020 (1534.9 mm). All districts have received a higher rainfall in 2021 compared to 2020. Out of them, three districts i.e., Kandy (105%), Hambantota (101%) and Mannar (101%) have received more than the doubled rainfall compared to those of the previous year. Seven districts, i. e. Moneragala (88%), Puttalam (82%), Matale (80%), Rathnapura (75%), Ampara (67%), Gampaha (61%) and Kalutara (50%) districts have received more than 50% higher rainfall in 2021 compared to those of 2020. The rest of the districts also have received higher rainfall but with varying degrees in 2021 compared to 2020, where the highest was recorded from Anuradhapura (45%) and the lowest was from Batticaloa (4%). With respect to the mean annual rainfall of coconut growing districts during the past ten-year period, 2021 has been recorded as 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 2021 compared to 2020.

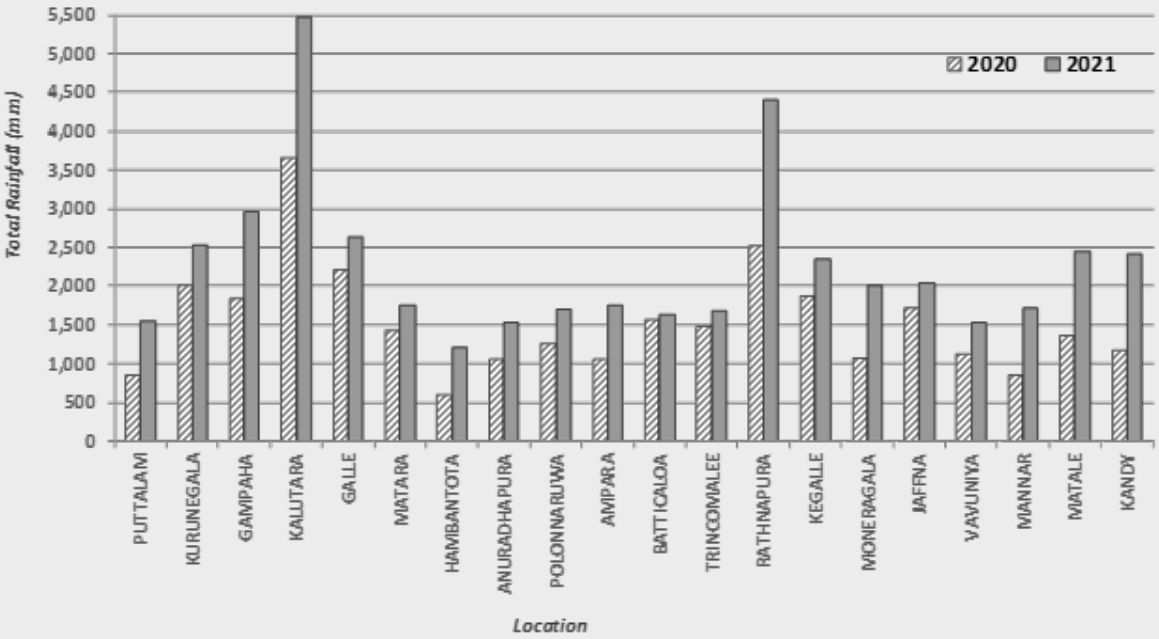


Fig. 2. Comparison of total rainfall (mm) of 2020 and 2021 in coconut growing districts

Outbreak of whitefly in coconut plantations

Crop Protection Division

The new whitefly outbreak which was reported from 2019 mainly in the Wet zone was continued to spread in 2021. Severe infestations were reported from many regions in the Colombo and Gampaha districts. When the whitefly populations were very high, they infested coconut fruits and petioles and they were observed on other crops such as banana, curry leaves, Indian almond, areca nut, ornamental palms and other plants, chillies, brinjals and other annual and perennial crops. A survey was conducted in Kegalle, Gampaha and Colombo districts to identify the whitefly species and associated insect species.

Three species of whitefly were identified. They were *Aleurodicus dispersus, Paraleyrodes minei* and *Aleurotrachelus atratus*. Populations of *A. atratus* represented 55.7% of the total population. *Jauravia pallidula* was found as a natural enemy associated with *A. atratus*. However, the abundance of *J. pallidula* was very low. *Panonychus ulmi* (European red mite), *Brevipalpus californicus* (scarlet mite) and mealybug species were also identified as insects associated with coconut whiteflies but their abundance was also very low. Abundance of whitefly as a group was not significantly different in districts. However, the abundance of the individual species significantly varied among districts, among locations and even among palms.

Coconut palms with brown or yellow nuts and king coconut palms were more severely infested than the coconut palms with green colour nuts.

Fig. 1. Severe whitefly infestation with damage on fruits and fronds in coconut in Mutwal, Colombo

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). Four sampling rounds were completed and a total of 372 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 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 BLASTn similarity search through NCBI, seven new phytoplasma isolates were identified and deposited in the GenBank (Table 1). None of the other fastidious prokaryotes except phytoplasma gave positive results for PCR so far.

Table 1. New Phytoplasma isolates associated with WCLWD

Sample ID	BLASTn best match pathogen	Percent similarity	Accession number
Weligama Isolate 1	Sugarcane white leaf phytoplasma	100	MZ822450
Weligama Isolate 2	Sugarcane white leaf phytoplasma	99.88	MZ822449
Weligama Isolate 3	Sugarcane white leaf phytoplasma	100	MZ822431
Weligama Isolate 4	Sugarcane white leaf phytoplasma	98.83	MZ822432
Weligama Isolate 5	Sugarcane white leaf phytoplasma	99.65	MZ822428
Weligama Isolate 6	Sugarcane white leaf phytoplasma	99.77	MZ822430
Weligama Isolate 7	Sugarcane white leaf phytoplasma	99.64	MZ822429

Identification of the association of phytoplasma with Leaf Scorch Decline (LSD) in Weligama Coconut Leaf Wilt Disease (WCLWD) affected area through molecular detection.

Crop Protection Division

Total genomic DNA was isolated from leaf, inflorescence and root samples taken from LSD affected palms in Weligama area using the modified CTAB method and Nested Polymerase Chain Reaction (Nested PCR) was performed using phytoplasma specific universal primers targeting 16S rRNA region. The samples subjected for PCR test were positive for 83%, 08% and 25% of the bud leaf tissues, inflorescence, and root tissues respectively. Selected PCR products were subjected to Sanger sequencing and BLASTn results confirmed that the pathogen isolated was 99-100% similar to sequences of Sugarcane White Leaf or Grassy Shoot Disease Phytoplasma in the GenBank. Also, the phytoplasma infected LSD palms were symptomless for WCLWD. Furthermore, PCR positivity of LSD affected tissue samples taken from WCLWD free areas was not yet observed. Hence, there is no clear evidence to confirm the causal agent of LSD as phytoplasma. This may be due to the secondary infection of phytoplasma to the LSD palms in the Southern area. Further investigations of tissue samples taken from WCLWD free areas are needed to confirm the etiology of LSD.

Selection of the best sampling tissue for population scale molecular detection of Phytoplasma associated with Weligama Coconut Leaf Wilt Disease (WCLWD)

Crop Protection Division

Unlike many other field crops, sample collection to capture a sufficient dose of the phytoplasma for molecular detection can be challenging in palms due to their tall stature and the low titer of the pathogen. Therefore, it is essential to identify a suitable tissue for the accurate detection of the pathogen. Hence, this study was conducted to determine the tissue distribution of the pathogen within the coconut palm and to identify the best sampling tissue type for population level screening.

It was found that coconut bud leaf is the best sampling tissue for population scale molecular detection of phytoplasma from the symptomatic as well as apparently healthy (asymptomatic) coconut palms (Table 2).

Table 2. Percent PCR positivity of different coconut tissue samples for phytoplasma in WCLWD affected area

Sample type	Tissue type	No. of samples	No. of positive samples	Percent PCR positivity
WCLWD symptomatic coconut palm	Bud leaf	18	15	83%
	Young inflorescence	18	6	33%
	Root	18	6	33%
WCLWD Asymptomatic coconut palm	Bud leaf	18	16	88%
	Young inflorescence	18	2	11%
	Root	18	4	22%
LSD symptomatic coconut palms from Weligama area	Bud leaf	18	16	88%
	Young inflorescence	18	1	05%
	Root	18	7	38%

Evidence for translocation of Weligama Coconut Leaf Wilt Disease (WCLWD) causing Phytoplasma through phloem tissues and systemic infection in affected coconut palms

Crop Protection Division

It is known that the phytoplasmas are translocated through phloem sieve tubes and accumulate in sink tissues. As all phytoplasma are vector transmitted, the primary infection sites are the young leaves. This study was conducted to determine the movement of phytoplasma within the WCLWD affected coconut palms and confirm the systemic nature of the infection.

The presence of phytoplasma has been identified and confirmed by sequencing in inflorescence and root tissues. As all phytoplasma diseases are vector transmitted and vectors transmit the pathogen while piercing the sieve elements of leaves, the pathogen would not be found in any tissue of the coconut palms if there is no translocation through the sieve tubes. But,

according to the results obtained from this study, phytoplasma has been observed in inflorescence and root tissues far away from leaves. As the sieve tubes are inter-connected with the leaf and other organs of the palm, forming a network, translocation of WCLWD causing phytoplasma through phloem sieve tubes and the systemic infections is confirmed.

Incubation period prior to the visual symptoms expression in Weligama Coconut Leaf Wilt Disease (WCLWD)

Crop Protection Division

All the WCLWD affected palms do not show visual symptoms at once which may be due to the presence of an incubation period prior to symptoms expression. The incubation period is considered the time period between the pathogen infection and visual symptoms appearance of coconut palms. This phenomenon has become a considerable problem in identifying diseased palms based on visual symptoms. Because of this incubation period, predictions cannot be made by looking at palms as the hidden infections may be associated with healthy-looking palms. Therefore, this study was conducted to identify whether an incubation period is associated with the WCLWD in Sri Lanka with scientific evidence.

Table 3. PCR positivity or negativity for phytoplasma and WCLWD symptom recordings in two sampling rounds

Palm No	PCR positivity or negativity and WCLWD symptoms expression							
	1 st PCR			Visual Symptoms	2 nd PCR (After one year)			Visual Symptoms
	BL	IF	RT		BL	IF	RT	
1	P	N	N	None	P	N	N	None
2	P	N	N	None	P	P	N	None
3	P	N	N	None	P	N	N	None
4	P	N	N	None	P	P	N	None
5	P	N	N	None	P	N	P	None

BL- Bud leaf, IF- Inflorescence, RT- Root, P – Positive, N - Negative

According to the results (Table 3), it is clear that healthy-looking WCLWD asymptomatic palms can harbor phytoplasma infection for longer periods

without expressing any visual symptoms. During this period the infection has spread to the inflorescence in two palms and to roots in one palm. In this case, all the palms have been remaining symptomless for at least one year. Due to the inability to predict the first date of infection, this time period may be longer than this. Therefore, the presence of an incubation period of at least one year or more for WCLWD was confirmed. The experiment is in progress.

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. Four 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 & PRODUCT DEVELOPMENT

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

Coconut Processing Research Division

Extra virgin coconut oil (VCO) is the coconut oil produced using coconut milk without application of the heat. In this process, oil in coconut milk is allowed to separate naturally, which takes 24-48 hours. This method is known as the natural fermentation method of extra VCO production. The objective of this research is to find effective microbes to accelerate this process. Eight different types of microbes were isolated from naturally fermented coconut milk and they were identified through biochemical assays. The microbes are listed below.

A-*Eubacterium*
B-*Flavobacterum*
C-*Lactobacillus*
D-*Lactobacillus*
E-*Erysipelothrix*
F-*Eubacterim*
G-*Acinetobacter*
H-*Erysipelothrix*

Isolated microorganisms were used for the fermentation process individually and as combinations to identify the most effective microorganisms for the natural fermentation p rocess. Finally, yields of VCO were measured in 24 hours for the selection of the microorganism who produced a maximum yield of oil in minimum time duration. The highest oil volume was recorded by Lactobacillus. The experiment is in progress.

Development of coconut Butter

Coconut Processing Research Division

Coconut butter with the unique flavor of coconut was developed as further improvements to the previously developed coconut butter spread with dehydrated coconut, sugar, peanuts, cocoa powder and salt.

Through sensory analysis, the formula of 65% of DC, 25% of sugar and 0.5% of salt was selected as the best treatment, while preserving the unique taste of coconut. Layer separation is a major drawback when the product is stored at room temperature. In order to minimize layer separation, three different levels of palm stearin and soy lecithin were incorporated. Ten percent of corn starch with 1.5% of palm stearin was selected as the best emulsifiers to minimize the layer separation of coconut butter spread. The experiment is in progress.

Fig. 1. Coconut butter spread

Biodegradable Packaging from coconut protein isolates

Coconut Processing Research Division

Preparation of biodegradable films using coconut protein concentrated from defatted dehydrated coconut residue obtained from virgin coconut oil extraction was continued. Optimization of pH and concentrations of cornstarch, coconut protein and Poly Ethylene Glycol (PEG) were performed according to a factorial design. The study concluded that the film prepared using 3% coconut protein, without the addition of PEG (only 2% glycerol) and the adjusted pH of 8.5 exhibited properties with high overall acceptability.

To improve the value of the film with antimicrobial properties, two levels of cinnamon (0% - P1, 0.05% - P2 and 0.1% - P3) powder were incorporated while increasing the film size using glass plates. The antimicrobial activity of the sample was measured by diffusion method and it has been observed that the growth of microbial action was reduced with the increase of cinnamon level. The film thickness was increased significantly with the value addition using cinnamon powder. Significantly higher thickness of 0.3mm was resulted with the incorporation of 0.1% of cinnamon compared to 0.05% cinnamon. A higher swelling index of 193.65% was resulted from the sample with the 0.05% cinnamon incorporation than 0.1% cinnamon incorporation.

Further analysis and application of packaging material are in progress.

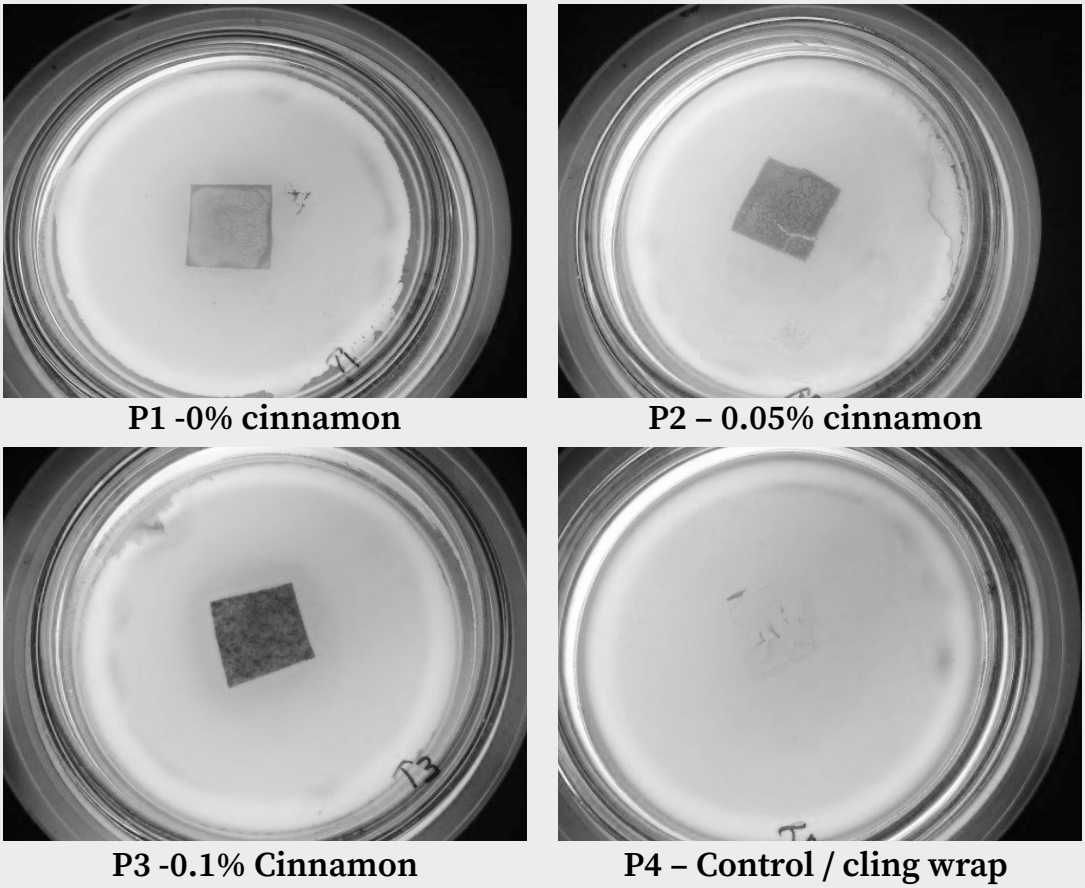


Fig. 2. Antimicrobial activity of packaging material with different cinnamon concentrations

Glycemic Index of coconut, jaggery made from coconut sap collected by the traditional method

Coconut Processing Research Division

A clinical study was completed using 40 human subjects to find out the glycemic index of coconut jaggery.

Glucose response and Glycemic Index (GI) of Jaggery prepared by the traditional sap collection method with Hal bark, and value-added jaggery with 0.2% cinnamon (CIN Jaggery) and 0.05% nutmeg (NUT Jaggery) prepared from pure sap collected through novel sap collection method were evaluated. The three types of jaggery belonged to the group of medium glycemic index containing food (Table 1). The GI value of jaggery made from pure sap without

hal bark was 65.19 and that for sugar which is produced by cane was 60.76. The mean GI values obtained by the introduction of hal bark, nutmeg and cinnamon were 55.79, 57.56 and 59.45 respectively. The results showed that the GI could be lowered by incorporating hal bark, nutmeg and cinnamon in coconut jaggery.

Table 1. Glycemic index of value added coconut jaggery types

Jaggery Type	Glycemic Index	Glycemic Group
HAL Jaggery	55.79	Medium GI
NUT Jaggery	57.56	Medium GI
CIN Jaggery	59.45	Medium GI

Development of de-fatted testa flour added roti and pittu

Coconut Processing Research Division

The underutilized by-product of coconut testa in coconut processing factories was successfully utilized for the roti and pittu preparations. The incorporation of 20% de-fatted testa flour (TF) with 80% wheat flour (WF) with 60g of coconut meat, 30ml of water and 3.5g of salt was selected as the best ratio for value addition for roti.20% TF and 80% WF with 60g of coconut meat, 15ml of water and 2g of salt was the best ratio for Pittu.

Properties of the composite used for the preparation of roti and pittu were evaluated and compared with the properties of wheat flour.

According to the results, there was no significant difference ($P>0.05$) between selected flour blends (20% TF: 80% WF) with 100% wheat flour (WF) for Swelling capacity (SC), Bulk density (BD), Tapped density (TD) and Water Absorption Capacity (WAC). The functional properties of Oil absorption capacity (OAC) and Wettability (WT) were changed significantly ($P<0.05$) with the blending process. The incorporation of TF improves the oil absorption capacity showing repellent action for wetting.

Table 2. Functional properties of 20% TF:80% WF blend and 100% WF

Property	TF 20: WF 80 blend	WF 100%
SC (%)	15.67 ± 1.53a	16.33 ± 1.53a
BD (g/cc)	0.57 ± 0.01a	0.52 ± 0.03a
TD (g/cc)	0.77 ± 0.04a	0.78 ± 0.02a

OAC (%)	138.03 ± 4.75a	116.46 ± 6.98b
WAC (%)	154.60 ± 9.31a	134.24 ± 8.33a
WT (min)	0.34 ± 0.01a	1.38 ± 0.08b

The values are mean ± SD of three independent determinations. The value with different superscripts in a raw differ significantly (P<0.05).

Further nutritional analysis of samples is in progress.

Phenolic and flavonoids constituents of Coconut Testa Flour

Coconut Processing Research Division and Institute of Fundamental Studies

Coconut testa is an underutilized by-product in the desiccated coconut industry and is often used as an animal feed. However, it has a great potential as a functional ingredient in the food processing industry.

The overall findings of this study suggest that coconut testa flour (CTF) of all local coconut cultivars could be rich sources of phenolics and flavonoids, which had the ability to act as potential antioxidative and anti-hyperglycemic agents. The inter-varietal differences of coconut in the distribution of the individual phytochemicals are shown in Table 3.

Table 3.

Phenolics (mg/100g)	**Coconut Cultivar**				
	COM	**GT**	**RT**	**SR**	**TT**
Caffeic acid	1.50	1.60	1.34	1.40	1.51
Chlorogenic Acid	49.50	145.5	76.9	131.8	114.9
Gallic acid	2.13	2.16	2.13	2.14	n.d.
Ellagic acid	11.65	11.49	11.50	11.51	11.5
Ferulic acid	0.28	n.d.	0.29	0.31	n.d.
p-Coumaric acid	0.49	0.62	0.49	0.73	0.73
Sinapic acid	n.d.	n.d.	n.d.	n.d.	1.61
Vanillic acid	7.86	7.72	6.36	6.78	7.12
Epigallocatechin gallate	2.73	3.28	3.00	3.26	3.09
Quercetin	6.32	6.33	6.34	6.37	6.35
Rutin	1.92	1.45	1.50	1.52	1.57

Abbreviations: COM, commercial hybrid; GT, Gon Thembili; RT, Ran Thembili; SR, San Ramon; TT, TallxTall; nd, not detected.

Among the detected compounds, chlorogenic was the most predominant phenolic acid in all cultivars. Ellagic acid was the second most abundant phenolic constituent, followed by vanillic acid. Gallic and caffeic acids were the next most abundant phenolics present in CTF after vanillic acid. p-coumaric acid, vanillic acid, epigallocatechin gallate (EGCG), quercetin and rutin were other constituents present in all cultivars.

Effect of virgin coconut oil (VCO) on the treatment of Mild-to-moderate Alzheimer's disease

Coconut Processing Research Division and Faculty of Medicine of University of Kelaniya

The study conducted to investigate the effect of VCO on the memory and cognition of mild to moderate alzheimer patients was concluded. The study consisted of a double-blind placebo-controlled clinical trial involving 120 mild to moderate alzheimer patients (MMSE=15-25) randomly allocated to treatments (feeding with 30ml VCO/day) and a control group (feeding 30ml canola oil/day). The study conducted by the Faculty of Medicine of the University of Kelaniya revealed that there was no significant difference in memory scores, lipid profiles and HbA1c levels between the two groups. However, the MMSE scores were improved among the APOE 4 carriers who had VCO compared to non-carriers, whereas APOE 4 status did not influence the memory scores of the patients fed with canola oil. Further, the study showed that VCO did not increase cholesterol or triglycerides compared to canola oil.

Improvement of Glucose tolerance in non-diabetic rats compared to diabetes induced rats by feeding virgin coconut oil (VCO) or Soya oil (SO)

Coconut Processing Research Division and Faculty of Medicine of the University of Peradeniya

Diabetes mellitus is a chronic disease caused by either absolute insulin deficiency or impaired insulin action and characterized by hyperglycemia. This study aimed to elucidate the effect of VCO or SO on glucose tolerance in diabetic (D) and non-diabetic (ND) rats. Three groups of randomly selected Sprague Dawley rats (n=8 each; 6-8 weeks old; 150-200 g) were randomly allocated to the diabetic group (D) and were induced diabetic status with alloxane while 3 groups were allocated to the ND group. Three groups in each category were fed with water, VCO or SO with 7.5ml/kg body weight/day for

90 days. The oral glucose tolerance test (OGTT) was not significant in the diabetic group while a highly significant variation was observed ($p<0.001$) in the ND group with water and oil-fed groups. The results showed that VCO and SO were capable of improving the glucose tolerance when insulin was available, but not in absence.

Coir – rubber composite for cushion/mattress

Coconut Processing Research Division

The study conducted to find out suitable coir fibre type for a coir based cushion and mattress found that 100% Omat fibre with density of 80 kg/m3 satisfied the compression set, indentation hardness(N), resistance to aging (percent) of the SLS standards and it is acceptable for manufacture of mattresses.

The mattress samples were tested for making 47x40x11cm3 size cushions and were tested for best cushion among the samples produced from omat or mattress fibre, with reference to the human acceptability. Cushion samples were fabricated using the same formular and acceptability was analyzed by considering the preference of 12 panelists by sitting 5 hrs/day duration for 6 months. For the tested parameters viz. "comfort when sitting" and, "feeling of comfort to muscle", significantly higher preference ($p< 0.05$) was found to be for the cushions made by omat compared to that of cushions made by mattress fibre. There were no significant differences for the parameters viz. 'increase of temperature when sitting', difficulty in breathing due to emission of toxic gases from the cushion" and "sweating due to increase of temperature". From these results cushion made from omat fibre (100%) was found to be highly acceptable and can be recommended for the production of high-quality cushions.

Evaluation of coconut husks retting method

Coconut Processing Research Division

Production of bristle fibre takes long time as it needs soaking of coconut husks for nearly three months' period of retting in order to loosen coir fibre in husks before mechanical extraction. Usually, the coir industry uses natural retting pits for soaking coconut husks. The process of natural retting has drawbacks such as water pollution due to seepage of ret liquor to groundwater, difficulty in removal of retted coconut husks from retting pits and labour shortage. As a remedy, concrete tanks are used for husk retting instead of conventional husk retting in natural retting pits. This study was

conducted to evaluate the bristle fibre extracting efficiency of the husks retted with two methods.

The results of the study show that the Electrical Conductivity (EC) is increased from 702±8.05µs to 781±23µs with the time from 4 to 12 weeks in the concrete retting tank method (CRTM). EC in the natural retting pit method (NRPM) is increased from 716±6µs to 812±9µs from 4 to 12 weeks. A slight change in pH was observed in both retting methods. Microbial count was also changed with the retting time. The highest amount of bristle fibre was obtained from 3 months retted coconut husks and they were 9.48 ±1.75 % from CRTM and 9.11 ±1.12 from NRPM. No significant difference in bristle fibre amount was observed in both methods. Therefore, the concrete tank method can be recommended for coconut husk soaking prior to extraction of fibre, instead of natural husk retting tanks.

Development of comfortable gloves and rubber boots by applying coconut husk products

Coconut Processing Research Division

Natural rubber with coir composite is becoming popular due to its light weight, water resistance and low thermal conductivity. It is important to produce low sweating, light weight boots and gloves by mixing coir and natural rubber for body protection comfortably.

The objective of this study is to add value to coir fibre to minimize sweating due to heat in rubber boots and rubber gloves. Coir fiber in different length sizes of 0-0.5mm and 0.5-1mm is used to make the coir-rubber composite and to analyze the suitability of the length sizes. Results showed that 0-0.5mm coir fiber gives high tensile strength (13±1MPa) for the treatment in which 40% (w/w) of the carbon black was replaced with coir fibre.

Overall Sector Performances of Kernel, Fiber and Other products

Agricultural Economics & Agribusiness Management Division

Coconut as a main component of the economy of Sri Lanka contributes a significant share of income to the economy while providing multiple inputs to the society. In 2021, the coconut industry marked the highest coconut production of 3382.9 million nuts, which is a 20% increase in comparison to the nut production of 2818.3 million in 2020, while earning the highest foreign exchange of Rs. 166 billion (USD 834 million). These are remarkable achievements in the history of coconut. Rainfall pattern was favourable for the coconut production during the whole year in coconut growing areas.

Coconut oil production which was 19,759 MT in 2020 has increased to 43,038 MT which is a very high significant growth of 117%. Export of Coconut milk was increased by 14% from the previous year's value of 46,626 MT. Virgin coconut oil industry has shown an overall 3% growth while the Desiccated coconut (DC) production has shown 22% growth compared to the previous year. Among kernel products, DC and coconut milk have highly contributed towards the export revenue bringing USD 107.85 million and USD 102.94 million respectively to the economy. DC prices have maintained at a favourable level in the whole year while maintaining the local coconut oil prices also at a favourable level in the whole year. This is mainly due to the maintaining of reasonable price margins for growers, industry, and consumers with the intervention of the Common Association of Industry, Coconut Research Institute, Coconut Development Authority and the Ministry. Further, during the whole year, with the recommendation of the Coconut Research Institute, the Special Commodity Levy was maintained unchanged, which supported to continue these prices. Meanwhile, copra showed a negative growth in exports which is around 23%.

The export revenue by shell products and fibre finished products has drastically increased by 42% and 33% respectively in this year. Under the category of finished products of fibre, the highest contribution to the export earnings was from the moulded coir products.

The edible oil importation has increased during the first half of the year but in the second half of the year, it has decreased by 30% relative to the previous year. However, the overall reduction of the quantity of imports of edible oil is around 8%, from 219,295 MT to 202,269 MT. At the same time, the export cost of the edible oil has increased by 52% compared to the previous year.

Modelling Coconut Prices to Develop a Price Forecasting Model

Agricultural Economics and Agribusiness Management Division and Plant Physiology Division

The global supply and demand for coconuts and coconut-based products have been increased tremendously over the past decades; hence, the industry has become one of the significant contributors to the economies of producer countries. However, similar to the other agricultural industries, coconut has been confronted by fluctuation in prices and accords to the importance of reliable price modelling and forecasting techniques to ease the burden on the value chain actors.

A feed forward neural network model was fitted using the average monthly farmgate price of fresh coconut in Puttalam, Kurunegala, and Gampaha coconut cultivation regions (CCBR) in Sri Lanka from January 2009 to December 2019 as output variable and first two lags of fresh nut production and farmgate prices as classifying variables. The results showed a greater accuracy for forecasting two-month ahead farmgate price of coconuts. The model accuracy was obtained in R values for training, validation and testing respectively as 0.97, 0.96 and 0.97. The farmgate price for first four months of 2021 was forecasted bimonthly as Rs. 65.94 for January/February and 61.4 for March/April using the Annual National Coconut Production forecast.

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

Agricultural Economics & Agribusiness Management Division

The food consumption pattern among the households in Sri Lanka has been gradually changing over the last few decades which is also visible in the edible oil market along with the introduction of various substitutes. This is driven by not only economic and demographic factors but also changes in lifestyle which influences consumers' tastes and preferences.

In this study households, belonging to urban and rural sectors were considered and estate sector households are yet to be surveyed. According

to the estimates, the majority of the households use coconut oil for their cooking purposes in both urban and rural sectors and only about 2% utilize both coconut oil and palm oil. Rural households are more inclined towards homemade coconut oil whereas a major proportion of the urban households tend to purchase from local stores. Availability acts as a strong influential factor in determining the choice of edible oil followed by price among the households. Out of coconut oil consuming households, a greater proportion consumes 1-2 litres/month while about 29% consume 2-3 litres/month and nearly 10% more than 3 litres/month. Rural households include coconut oil at least for two meals each day whereas urban households for one meal each day. However, nearly 45% of the households have changed their number of oil included meals per day owing to health concerns. Only 6% of the households have changed the type of edible oil they were utilizing during the past years and have majorly transformed from coconut oil to palm oil mostly due to the unavailability.

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

Agricultural Economics & Agribusiness Management Division and Crop Protection Division

This study was conducted to access the effectiveness of release of predatory mite, Neoseiulus baraki to control Aceria mite at farmer field conditions. The experiment was started with the collaboration of Kurunegala Plantations Ltd who is already involved in breeding predatory mite in their own laboratories. The release of predatory mites was continued for two years as recommended by the Coconut Research Institute and 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. This reduction is significant ($P< 0.05$). Further, among the full priced nuts number of mite damage nuts has reduced from 3.5 to 2.5 nuts per palm month. The experiment is being continued to study the residual impact of releasing the predatory mites.

Evaluation of the success of coconut replanting programs of Sri Lanka

Agricultural Economics & Agribusiness Management Division

The Coconut Cultivation Board with the Coconut Research Institute annually produces coconut seedlings to support the national replanting program with the aim of making Sri Lankan coconut industry sustainable.

However, there is no cross evaluation of the replanting program to understand how successful these seedlings are in the field level to cater the future coconut industry. This study evaluates the current situation of the seedlings distributed in Sri Lanka since 2015 to understand the gaps in national replanting program and to evaluate the effectiveness of coconut replanting program, seedling mortality rate at the field level and root causes of the seedling mortality and thereby the gaps in technology dissemination.

The survey conducted in the 360 estates in Gampaha and Puttalam Coconut Cultivation Board (CCB) regions with coconut seedlings issued during the period 2014 - 2017 indicated that the mortality rate of the field planted seedlings was 27%, 23%, 29% and 40% respectively during 2014, 2015, 2016 and 2017. In all four years >80% mortality was due to four main reasons, drought (14 - 51%), Black Beetle (15 – 39%), Red Weevil (11 - 21%) and Porcupine damages (13 – 39%). A detailed analysis will be done after the data collection is completed in all CCB regions.

Market dynamics and industry setting of coir fiber sector (2019-2021)

Agricultural Economics & Agribusiness Management Division

Formation of a national policy for coir industry is an urgent need which is already been identified by the Ministry of Plantation Industries. Therefore, the main objective of this study is to derive recommendations to form a national policy for coir fiber sector. One of the specific objectives is to identify historic trends in the global market. The world market share of Sri Lanka in 1980-1989 period was as high as 70% and it declined to 40% during 2000-2009 period. However, Sri Lanka is able to increase its global market share by more than 45% during the last decade. A survey was started to a) study and identify the value chains of coir fiber sector, b) identify factors affecting value addition of coir fiber. But the completion of the study was delayed due to the COVID-19 pandemic situation and hence data analysis is in progress.

DEVELOPMENTAL RESEARCH

Demonstrations of farming systems

Agronomy Division

i. Bio-energy Production

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

Fig. 1. Gliricidia cultivation and bio-energy production unit at Rathmalagara Estate

ii. Livestock integration

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

Fig. 2. Goat and sheep farming demonstrations at Rathmalagara Research Center

iii. Pasture and fodder demonstrations

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

Fig. 3. Pasture and fodder grass demonstrations at Rathmalagara and Bandirippuwa Research Centers

iv. Vermicompost production

Vermicompost production unit in Rathmalagara 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 and agriculture schools and students.

Fig. 4. Vermicomposting demonstration at Rathmalagara Research Center

v. Intercropping demonstrations

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

Fig. 5. Intercropping demonstrations at Makandura and Rathmalagara Estates

Establishment of a new coconut seed garden for coconut hybrid production in the Wet- Intermediate Zone

Genetics and Plant Breeding Division

Coconut hybrids are early flowering and produce 40-50% more yields compared to the Tall cultivars. Therefore, the cultivation of hybrid coconuts is the way forward in increasing the national coconut production. However, currently the hybrid seednut production is very low and its contribution to the total annual coconut seednut production is only 2%. Among the recommended coconut hybrids CRIC65 is produced at the Isolated Seed Garden, Ambakelle through directed pollination and all the other hybrids are produced in limited quantities at the Coconut Research Institute (CRI) estates through hand pollination.

Therefore, Coconut Research Institute proposed a collaborative development project with the Kurunegala Plantations Ltd (KPL) to establish a seed garden to produce Kapsuwaya hybrid seednuts. In 2021, CRI received funds through the ministry to implement this project. CRI and KPL signed a memorandum of understanding on 22-10-2021to assist the establishment and maintenance of the seed garden.

Seventy-five acres from the Carlsfield Division of Kurunegala Area Estate was selected to establish the seed garden and over 4500 seedlings will be planted there, as mother palms. After the yield establishment of the mother palms,

the Kapsuwaya seed production capacity of the seed garden will be about 200,000. During 2021, the initiatives were taken to establish a fence around the seed garden and to establish a sub-surface irrigation system. The initial land preparation was completed to plant 650 seedlings. However, planting could not be carried out during Maha 2021 due to heavy rains.

Signing the MoU between CRI and KPL to establish a new hybrid seed garden at Carlsfield Division, Kurunegala Area Estate

Upgrading the Kiniyama Seed Garden

Genetics and Plant Breeding Division

Kiniyama Seed Garden was established by the Genetics and Plant Breeding Division, Coconut Research Institute in 2013 as a public-public partnership with Chilaw Plantations Ltd. to produce high yielding Kapruwana hybrid seednuts.

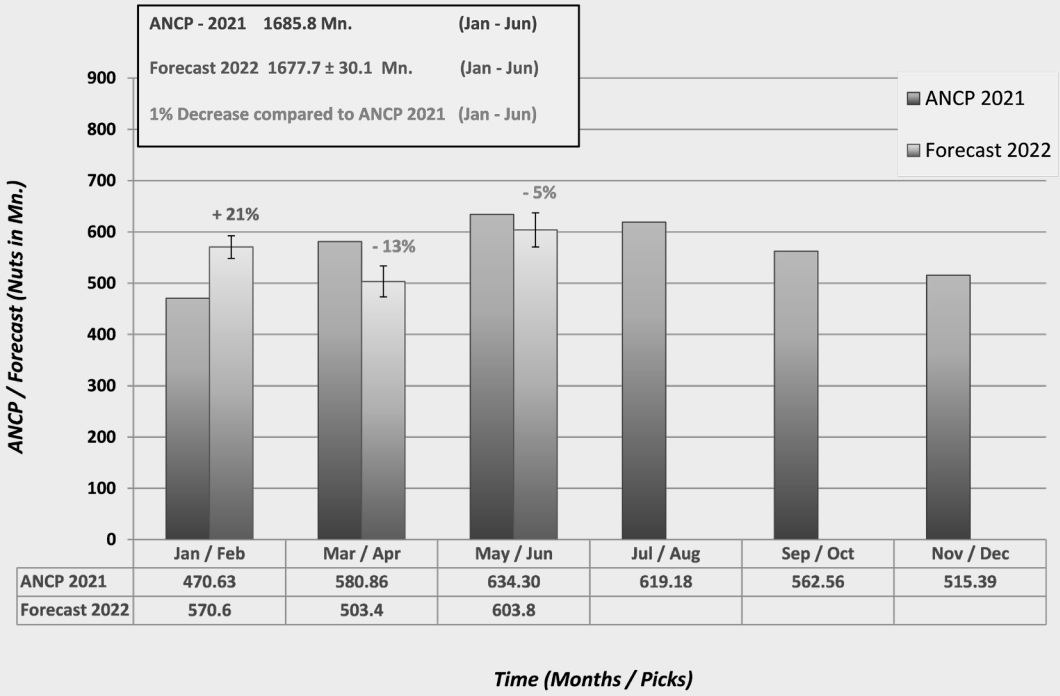
In 2021, Rs. 8 million was received through the ministry to upgrade the seed garden. During the year, 1075 Green Dwarf and Sanramon seedlings were planted to fill the vacancies and measures were taken to manage pest and diseases. The hand pollination programme will be recommenced in 2022 to produce Kapruwana seednuts.

Forecast of coconut yield of 2022

Plant Physiology Division

The expected change in the yield per palm in 2022 compared to that of 2021 was predicted for the main coconut growing areas; Kurunegala, Kuliyapitiya, Gampaha and Puttalam Coconut Cultivation Board Regions based on the fruit set data and the rate of survival of set fruits. Accordingly, Kurunegala and Gampaha districts will show 2% and 13% yield reductions

respectively in the first half of 2022 compared to that of 2021. However, it is expected to have an 8% increase in yield in Puttalam district within the first half of 2022. Accordingly, the bi-monthly coconut yield predictions for 2022 (up to June) are 570.6 ± 29.5 for January/February (Pick 1), 503.4 ± 29.0 for March/April (Pick 2) and 603.8 ± 32.8 for May/June (Pick 3) which amounts to a total of 1677.7 ± 30.4 Mn nuts for the period from January – June 2022. Although the forecast for pick 1 is 21% higher than the production of pick 1 in 2021, both Pick 2 and 3 will show 13% and 5% reductions with respect to the relevant productions in 2021. However, only 1% reduction is expected for the first 3 picks in 2022 with respect to that of 2021.



	Jan / Feb	Mar / Apr	May / Jun	Jul / Aug	Sep / Oct	Nov / Dec
ANCP 2021	470.63	580.86	634.30	619.18	562.56	515.39
Forecast 2022	570.6	503.4	603.8			

Fig. 6. The yield prediction for 2022 (Up to June) with bimonthly breakdowns compared to the bimonthly Annual National Coconut Production (ANCP) observed in 2021

TECHNOLOGY TRANSFER ACTIVITIES

Certificate Course for Coconut Cultivation and Value Addition

Technology Transfer Division

Due to the COVID pandemic situation in the country, Certificate Course for Coconut Cultivation and Value Addition was conducted as an online programme through the Zoom platform. Eight programmes were conducted for about 90 participants.

Technology dissemination through mass media 2021

Radio Programmes

- Four "Subarathi" radio discussion programmes (one hour) on coconut cultivation were broadcasted on "Sinhala National Service" of Sri Lanka Broadcasting Corporation on 07th, 14th, 21st, and 28th December.
- The division has participated in"Govithenata Peyak" a radio discussion on coconut cultivation and grower problems was broadcasted on "Sinhala National Service" of Sri Lanka Broadcasting Corporation on 01/11/2021.

Radio Advertisements

- 620 radio advertisements were broadcasted on "Sinhala National Service" and "Commercial Service" as News in Brief (Intro and Extra) during December.
- 1230 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) during December.

TV Advertising and TV Programmes

- One crawling massage namely "moisture conservation" was telecast on National Rupavahini TV channel for four weeks (400 times).
- "Saubagye Kapruka" a documentary programme was telecast on ITN channel on 11th December at 4.30 pm.
- "Saubagye Kapruka" a documentary programme was telecast on National Rupavahini channel on 17th December at 7.30 pm.

Training of Trainer (ToT) Programmes

Technology Transfer Division

Although it was scheduled to conduct 25 training of trainer (ToT) programmes only 4 ToT programmes were conducted due to COVID situation.

The staff of the Coconut Processing Research Division conducted several programs for transferring the technologies to the Industrial Development Board at Moratuwa and Kapruka Samithi of several districts.

Research Extension Dialogues

Technology Transfer Division

Two research extension dialogues were conducted in 2021. The first one was conducted with the field extension staff of Kalutara, Galle, Matara, Hambantota, Ampara, Ratnapura, Monaragala Coconut Cultivation Board regions using the Zoom technology on 31/03/2021. Another research extension dialogue was conducted with the Coconut Development Officers from Anuradhapura, Polonnaruwa, Vavunia, Jaffna, Trincomale and Batticaloa on 28/7/2021.

Distribution of leaflets through Sunday newspapers

Technology Transfer Division

During the year, 81,250 leaflets on different messages were distributed through Sunday newspapers in Meerigama, Dambadeniya, Makandura, Negombo, Dankotuwa, Seeduwa, Kochchikade, Naththandiya, Marawila, Kakkapalliya, Nikaweratiya, Pallama, Kuliyapitiya, Hettipola, Bangadeniya, Andigama, Giriulla, Ganemulla, Gampaha, Matara, Kamburugamuwa,

Ahangama, Galle, Veyangoda, Marandagahamula, Kadawatha Ja-ela, Kaluthara and Beruwala areas.

Exhibitions and crop clinics

Technology Transfer Division

The Technology Transfer Division has parcitipated in one exhibition and crop clinic at Wennappuwa.

Printing and Publications

During the year, following printing materials were published.

1. A booklet on "Planting and management of young plantations"
2. Organic Coconut Recommendation
3. Short Annual Report 2019
4. Long Annual report 2014, 2015
5. Technology Update (English)
6. Technology Update (Sinhala)
7. Cocos Vol. 23
8. Mage Pol Potha

The printing unit of the division undertook 38 printing jobs and binding jobs of Rs. 663,811.00 of other divisions. This includes annual reports, booklets, leaflets, official forms, circulars, various kinds of forms, datasheets, survey questionnaires, certificates, folders and handouts etc.

Third international certificate course on coconut plantation management

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

The Coconut Research Institute of Sri Lanka (CRISL) conducted the third International Certificate Course on Coconut Plantation Management from 4th October to 5th November 2021 jointly organized with the International Coconut Community (ICC). The identification of the CRISL as the host for

this training for the third time by International Coconut Community (ICC) is a mark of the international recognition of CRISL as a world-renowned institute dedicated solely for coconut research. This year program was conducted virtually on line due to the prevailed COVID pandemic situation all over the world. The program was well streamlined to cover all aspects on scientific coconut cultivation and management to the participants from coconut growing countries. The program spanned through a period of one month covering about 50 lectures / presentations on different aspects in relation to coconut. A comprehensive training manual was prepared and updated by the CRISL research staff for this course. The inaugural session of the training program was held with the participation of Dr Jelfina C Alouw, Executive Director / ICC, Mr. Ravindra Hewavitharana (Secretary / Ministry of Plantation), Ambassador Diar Nurbintoro, Acting Director, NAM Centre, Mr. William Castro Rodriguez, a representative from the International Trade Centre, Dr. Saranga Alahapperuma (Chairman, CRBSL) and Dr. Sanathanie Ranasinghe (Director, CRISL) and it was attended by more than 100 distinguish invitees including International participants and CRISL staff. There were 38 participants for the training program from 19 countries representing, Federated States of Micronesia (FSM), Fiji, Guyana, India, Indonesia, Jamaica, Kenya, Papua New Guinea, Samoa, Solomon Island, Thailand, Vietnam, Dominican Republic, Belize, Grenada, Trinidad, New Caledonia, Cambodia and Surinam. The training program was coordinated by Dr. Athula D Nainanayake (Course Director) and two course coordinators, Dr. D. M. A. C. Dissanayake and Dr. M. D. P. Kumarathunga.

Inaugural session of the Certificate Course for Coconut Development Officers – 4th October, 2021. From left to right, Dr. Athula Nainanayake (Course Director), Dr. Sanathanie Ranasinghe (Director CRISL), Dr. Saranga Alahapperuma (Chairman, Coconut Research Board), Dr. Nayanie Aratchige (Deputy Director Research, CRISL).

Technology Transfer Activities for Weligama Coconut Wilt Disease

Crop Protection Division

Two training programmes were conducted for Fied Inspectors and Field Officers of the Coconut Research Institute and Coconut Cultivation Board on "Symptoms identification of Weligama Coconut Leaf Wilt Disease".

Launching a set of Colloborative Stamps and two first day covers on international coconut day

Technology Transfer Division

Ten commemorative postal stamps on coconut related products and 02 first day covers were released to commemorate World Coconut Day, on 02 nd September, with the collaboration of State Ministry, Coconut Development Authority, Postal Department and CRI, under the patronage of the Prime Minister's office. These stamps were on Coconut oil, King Coconut, Coconut water, Desiccated Coconut, Coconut timber products, Ekle products, Fibrous products, Coconut Milk, Sap products and Shell products while the First Day covers were on CRIC 65 Hybrid coconut palm and the King Coconut.

CONTRIBUTION TO NATIONAL DEVELOPMENT THROUGH SERVICES TO STAKEHOLDERS

Seedling certification

Genetics and plant Breeding Division

In 2021, 187,597 of CRIC60, 28,145 of CRIC65, 10,888 of CRISL98, 3,978 of Kapruwana, 3,064 of Kapsuwaya, 1,908 of Kapsetha, 753 of CRISL2020, 38,838 of Moorock Tall and 34,253 of Plus Palm Tall were certified by the staff of the Seeds and Seedling Certification Unit of the Genetics and plant Breeding Division.

Fig. 1. Certified coconut seedlings

Issuing of Dikiri Coconut Seedlings

Tissue Culture Division

About 320 in vitro raised dikiri plants were acclimatized during the year and a new one-acre field trial was established at Walpita Research Center with dikiri plants.

Modelling Coconut Prices to Develop a Price Forecasting Model

Agricultural Economics and Agribusiness Management Division and Plant Physiololgy Division

A feed forward neural network model was fitted using the average monthly farmgate price of fresh coconut in Puttalam, Kurunegala, and Gampaha coconut cultivation regions (CCBR) in Sri Lanka from January 2009 to December 2019. Farmgate prices for first four months of 2021 were forecasted bimonthly as Rs. 65.94 for January/February and 61.4 for March/April using the Annual National Coconut Production forecast.

"Kapruka" SMS Service

Technology Transfer Division

During the year 2021, registered stakeholders received 65,162 messages on farmgate price of a coconut, DC price, Copra price, Coconut oil price bi-weekly and the yield prediction for the following month.

Kapruka Information Centre

Technology Transfer Division

1928 hot line service and 070 400 1928 WhatsApp number was introduced on October 22nd to the stakeholders to provide technical advice and information. The number of calls and WhatsApp messages received and responded were 1283 and 783 respectively.

Provide advisory services to growers

Technology Transfer Division

During the year, approximately 800 telephone calls and letters were received requesting technical advice and information. Most of the general requests were referred to the respective Coconut Cultivation Board regional managers for their action. Despite the COVID restrictions, division was able to visit 4 field inspections and submit reports with necessary recommendations.

Analytical Services

Soils & Plant Nutrition Division

Services	No of Samples analyzed
Differential Fertilizer Recommendation (DFR)	19
Coir Products	241
Organic Manure	15
Inorganic Fertilizer	15
Land suitability Assessment	16

Provide training programs to growers

Agronomy Division

Training programs were conducted for the Coconut Development Officers (CDO's), University and agricultural school/school students, plantation company officers, teachers and coconut growers. Further, technical contribution was provided to the Research Extension Dialogues, Productivity Improvement programs and other relevant extension activities.

Fig. 2. Field demonstrations

Services to stakeholders

Coconut Processing Research Division

Coconut Processing Research Division extended its services to stakeholders by analyzing samples (29 VCO samples, 29 white coconut oil samples, 17 DC samples, and 05 poonac samples, 03 scraped coconuts, 01 wine, 02 vinegar and 493 toddy). The technologies for coconut water beverage production, coconut ice cream making and coconut oil production were obtained by the stakeholders. Virgin coconut oil, white coconut oil and coconut water were the mostly sought technologies. One day training session was conducted for those interested in learning about the coconut products.

Fig. 3. Practical trainings on virgin coconut oil and white oil production were conducted at the incubation center.

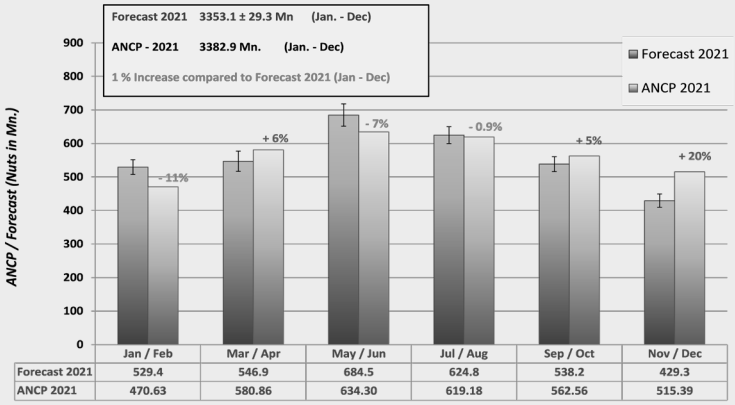
Estimation of National Yield of 2021 and Prediction of National Yield of 2022

Plant Physiology and Agricultural Economics & Agribusiness Management Divisions

The estimated national coconut production in 2021 was 3382.9 million nuts. It is about 20% increase compared to the production in 2020 (2818.1 million nuts). The predicted coconut production for 2021 was 3353.1 ± 29.3 million nuts which ranged from 3,323.8 to 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 issue 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.

(a)



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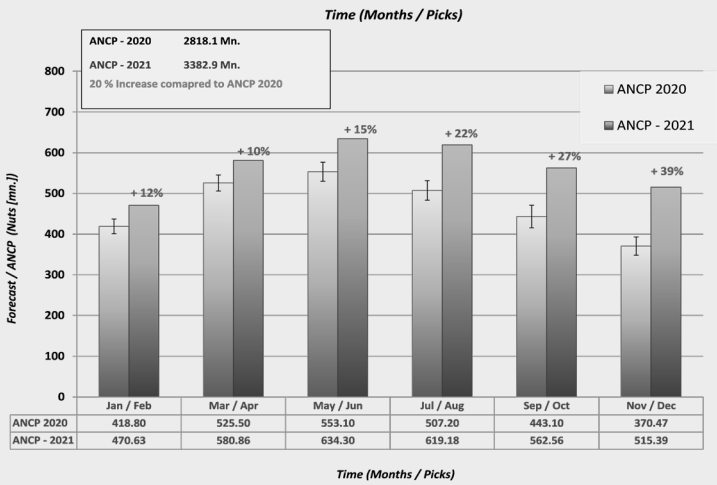


Fig. 4(a) Comparison of the actual Annual National Coconut Production (ANCP) on bimonthly basis for 2021 with the forecast and(b) its comparison with ANCP 2020

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 the Coconut Research Institute; Bandirippuwa Estate, Rathmalagara Estate, Isolated Seed Garden, Maduru Oya Seed Garden and Makandura Research Station 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. 5. Data recording at the 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 the shelf-life of king coconut was disseminated to more than 40 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 the level of 6 million. Even with the COVID 19 pandemic situation, king coconut exports have shown a remarkable increase in 2021 exceeding the quantity of 9.5 million nuts which contributed to revenue of about USD 900 million.

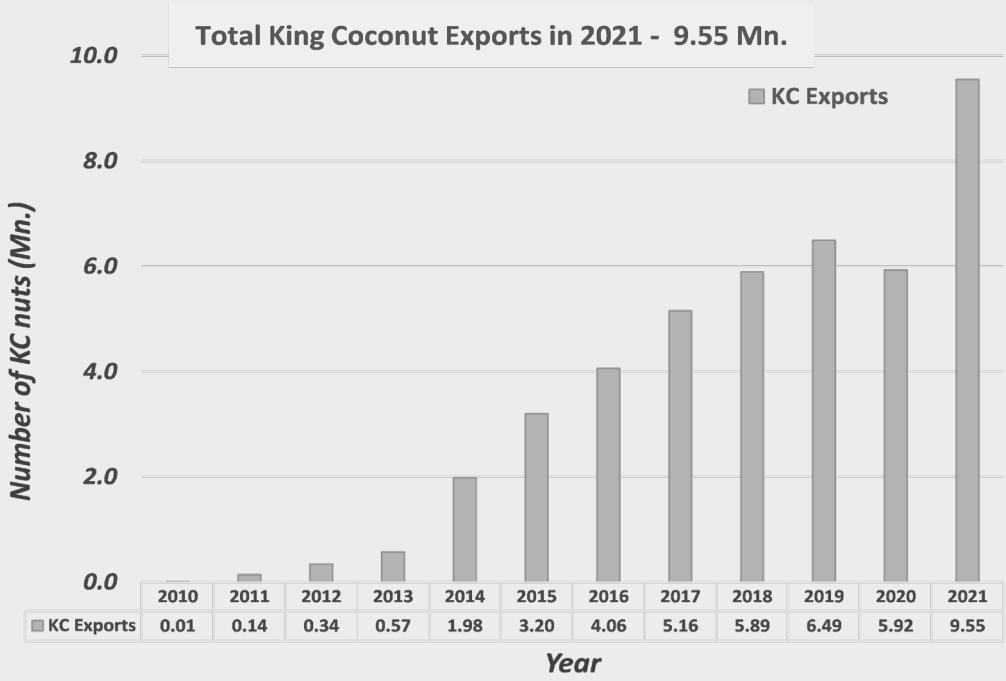


Fig. 6. Export of king coconuts during past 12 years using the protocol developed by CRI

Supply of information to other institutions and stakeholders

Agricultural Economics & Agribusiness Management Division

1. Provided information to update research database of Sri Lanka Council for Agricultural Research Policy.
2. Provided coconut statistics to Central Bank of Sri Lanka, Sri Lanka Treasury, Department of Census and Statistics many other institutes and stakeholders.
3. Provided valuation reports to value coconut trees removed for different purposes.
4. Provided statistics and information on coconut for the Budget speech and the library of the Sri Lanka Parliament.
5. Served as a Centre for Coconut Based Socio-Economic Statistics.
6. Issued the policy recommendations to the industry.
7. Update and maintain INFORM database submitted to Sri Lanka Council for Agricultural Research Policy

Production of predatory mites for the control of coconut mite

Crop Protection Division

Production and issue of predatory mites for the control of coconut mite were continued in 2021. Due to the COVID lockdowns, the demand for predatory mite sachets was low. However, 30,398 sachets were produced in the Coconut Research Institute and 15,390 were issued to the growers.

Usually, the Crop Protection Division also provides technical guidance to the predator mite laboratories maintained by the Coconut Cultivation Board (CCB). However, during the year, visits were not made to any of the CCB laboratories due to the COVID situation.

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

Crop Protection Division

Despite frequent disturbances to the program due to lockdowns in the endemic area and the quarantining of the Field Inspectors, the palm removal program of the WCLWD was continued in 2021. A total of 9,839 Lands in 11,457.88 Ac were inspected by the Coconut Research Institute. 694 diseased palms marked and 225 diseased palms removed. 85 diseased palms were killed by injecting the weedicides. Salary payments for Field Inspectors were completed. Compensations were paid for 212 removed palms.

Breeding of parasitoids to control the coconut caterpillar

Crop Protection Division

Severe outbreaks of coconut caterpillar were reported from many areas of the country. Crop Protection Division continued the breeding of parasitoids in the insectary for the management of coconut caterpillar outbreaks. A total of 634,790 parasitoids were released to coconut caterpillar infested estates. This number was achieved amidst the multiple lockdowns in the country. Although insecticides were not available in the country to control severe outbreaks of the coconut caterpillar, release of parasitoids could manage the pest to a substantial level.

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

Crop Protection Division

Laboratory of the Crop Protection Division synthesized red palm weevil aggregation pheromones and sold 595 pheromone vials and 50 improved gel pheromone sachets to the growers and the Coconut Cultivation Board.

Library Services

The library service was open only for a limited number of days due to the COVID - 19 pandemic. Regardless, the information requests were catered through online means as much as possible. Additionally, photocopying facilities were provided on request.

Engineering Services

During the year, installation of the new generator of 500KVA at the cost of Rs. 12.0 million were commenced and the following major renovations and maintenance works were conducted by the Engineering Unit.

Constructions under Capital Expenditure

1. Supply and Installation of 12 Nos of Growth Chambers.

Constructions/Repairs under Estate Funds

1. Construction of water-retaining structure at Banidirippuwa Research station at the cost of Rs. 1.9 million.
2. Construction of pollen processing laboratory and labor restroom at Pallama Genetic Resource Centre at the cost of Rs. 4.9 million.
3. Repairing of office laboratory Building at Kiniyama Seed Garden

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

NATIONAL COLLABORATIONS

Memoranda of understanding

Coconut Processing Research Division and Genetics and Plant Breeding Division

1. Memorandum of understanding between University Kelaniya to carry out research on "Randomized control trial of virgin coconut oil in the treatment of Alzheimer's Dementia" was continued in.
2. Memorandum of understanding between University of Peradeniya to carry out research on "Feasibility study of virgin coconut oil in ameliorating Type 2 diabetes in human" was continued.
3. Memorandum of understanding between Coconut Research Institute and the National Institute of Fundamental Studies to carry out the research on "Antioxidative 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, EDB, CDA and coir industries to develop a dryer for coir pith drying and a brittle fibre extraction machine similar to Ceylon drum machine was continued.
5. A memorandum of understanding was signed between the Coconut Research institute and the Kurunegala Plantations Ltd. to establish a seed garden to produce Kapsuwaya seednuts.

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 the 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 Research Centers.

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

The primary objective of the division is to maintain the 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. Moreover, facilities such as labor land, materials, protection for research fields are provided by the Estate Management Division.

Further, dissemination of new technologies through demonstration are conducted successfully by maintaining demonstration blocks in different estates for scientists, plantation managers, coconut growers, University, diploma and school students, and for other interested personals.

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	

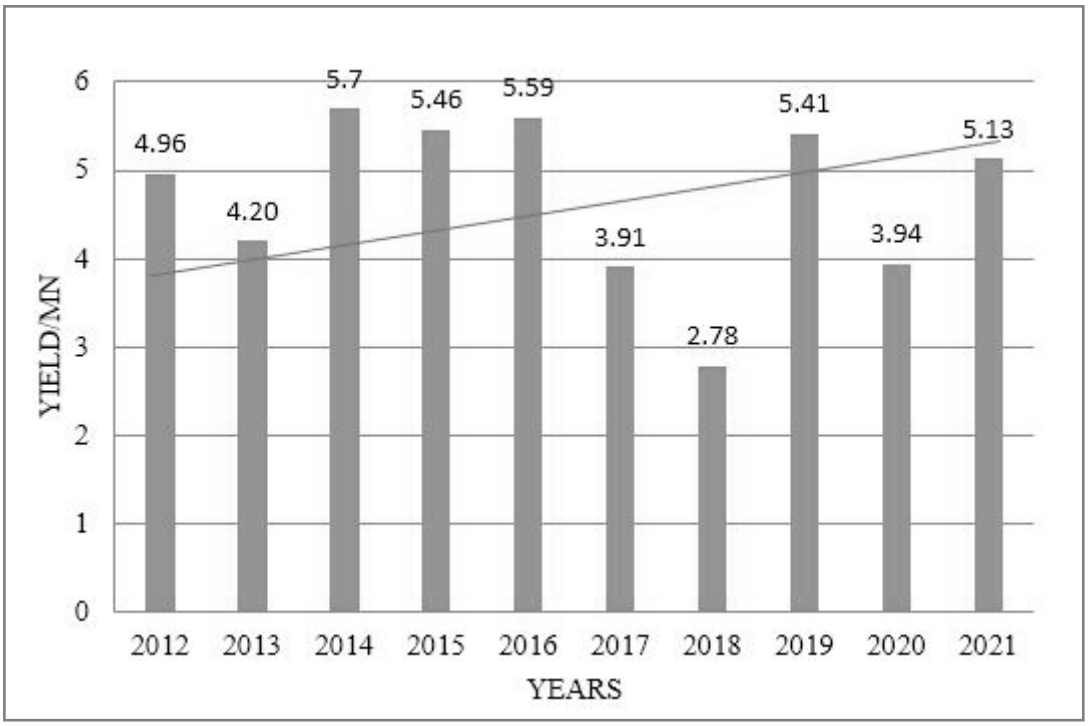


Figure 1 - Variation in coconut production in CRI Estates from 2012 to 2021.

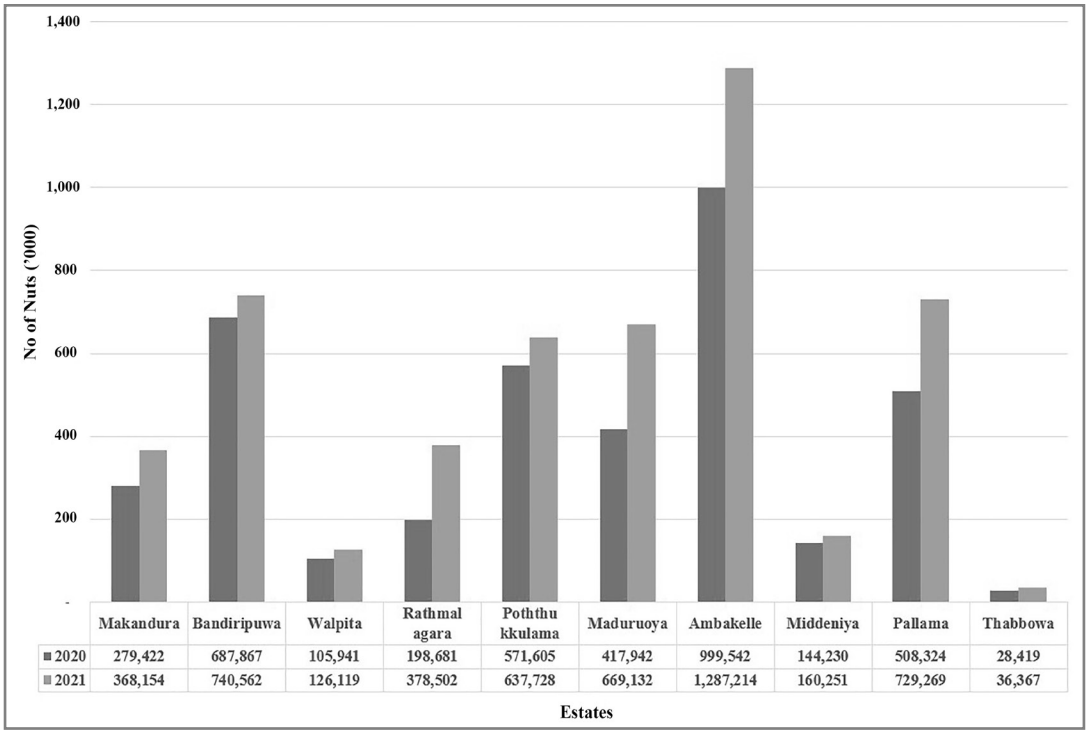
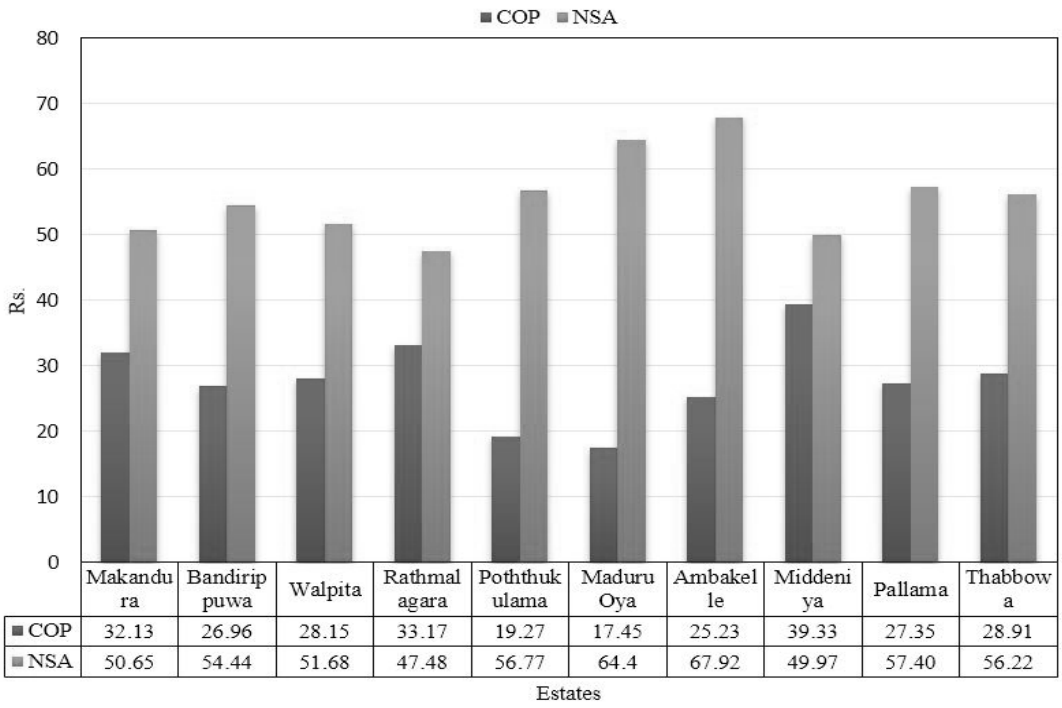


Figure 2 - Total production of CRI Estates in 2020 and 2021.

The total coconut yield of all CRI Estates in 2021 was nearly 5.13 million nuts. Majority of these nuts were sold though the auction conducted by the Coconut Development Authority.

COP and NSA of different estates are given in the Table. (2021)

The average cost of production (COP) of all Estates was Rs.27.80 per nut while Net Sale Average (NSA) was Rs. 55.69. Net profit of the all estates was Rs. 161 million in the year 2021.



	Makandura	Bandiripuwa	Walpita	Rathmalagara	Poththukulama	Maduru Oya	Ambakelle	Middeniya	Pallama	Thabbowa
COP	32.13	26.96	28.15	33.17	19.27	17.45	25.23	39.33	27.35	28.91
NSA	50.65	54.44	51.68	47.48	56.77	64.4	67.92	49.97	57.40	56.22

Figure 3 - COP and NSA of the CRI Estates

Ambakelle, Maduruoya and Pallama seed gardens are governed by the EMD to produce different types of quality coconut seeds to the plantation sector which is one of the major objectives of the EMD.

Ambakelle Genetics Resource Center and Pallama Genetics Resource Center, special blocks are maintained to produced CRIC 65 (DT) seeds to cater the extensive home garden development program. In the year 2021, 1.32 and 0.13 million seed nuts of CRIC 60 and CRIC65 were issued to the Coconut Nurseries respectively in 2021. By hand pollination program, 4,063 seed nuts of Kapruwana, 5,505 seed nuts of Kapsuwaya, 2,299 seed nuts of Kapsetha 3,184 seed nuts of TMRD (CRISL 2020) and 12,060 of CRISL98 (TSR) were issued to the CRI Coconut Nurseries respectively in 2021.

The variety CRISL98 (TSR) was produced only in pallama Genetics Resource Center and 12,060 seed nuts were issued to the Coconut Nurseries in 2021.

The plus palm seed nuts were produced only in walpita Research Center and 29,139 seed nuts were issued to the Coconut Nurseries in 2021.

All the CRI Estates maintained Coconut Nurseries with the objective of providing high quality seedlings to coconut growers. During the year, 113,329 seedlings were issued from these nurseries.

Cattle, buffalo, goat and sheep farming practices were conducted in the CRI estates. This facilitated the estates with organic manure, controlling weeds with a low cost. Usual cultural practices such as weeding, husk burring, contour drains, picking, pest and diseases control, mulching, fertilizer application, irrigation and rain water harvesting ponds were followed according to the schedule.

Chemical fertilizer was applied to nearly 74% of coconut palms in all the estates.

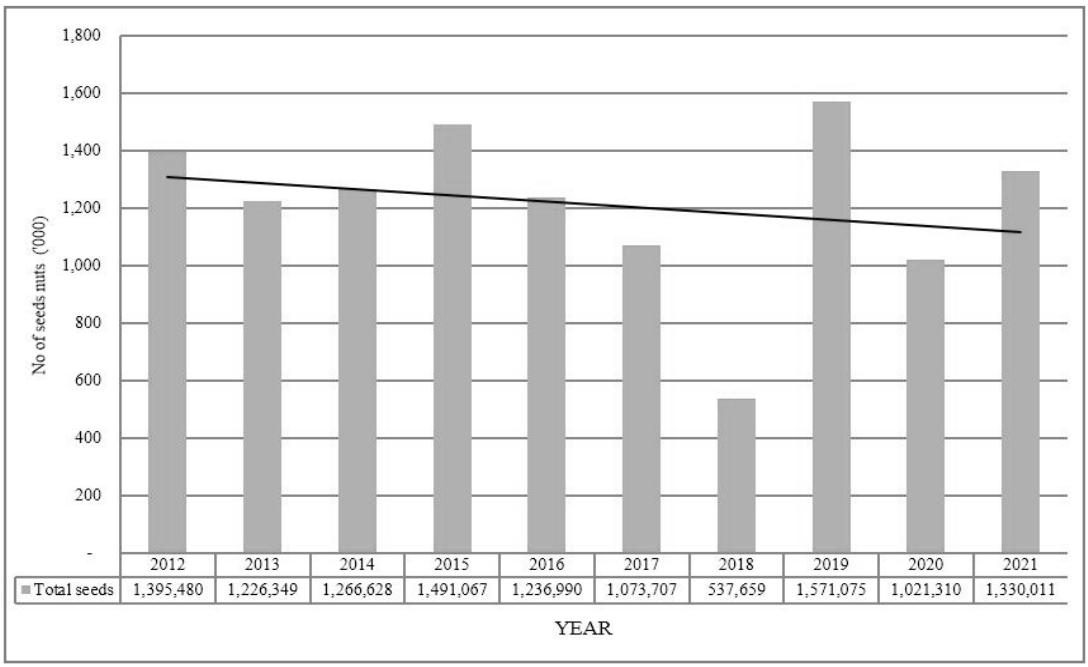


Figure 4 - Total seed production in all CRI estates from 2012 to 2021

Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
20575	46259	2073	3183	10813	961	3516	3599	23243

Summary of annual census of all estates

As per the census, total palm population of the estates is 90,979 except the palm vacancies. In this census categories, Unproductive Senile, Dud and Weak Palms which is about 8.87 %, are not benefited to the estates. Palms which are contributing to the yield (Well bearing, Bearing and partial bearing palms) covers about 75.74 % of the total.

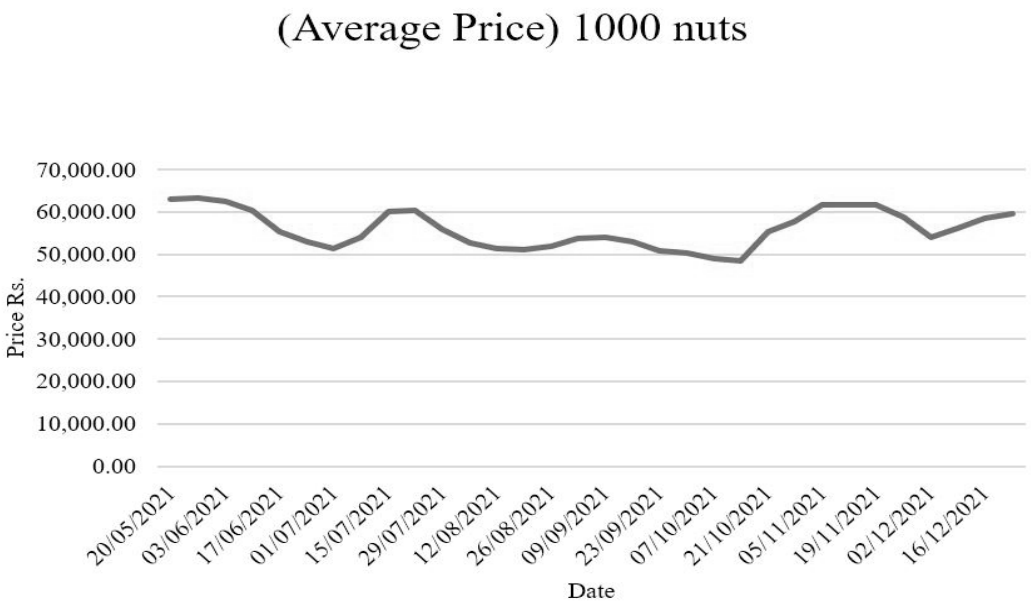


Figure 5 - Average auction price fluctuation per 1000 nuts in 2021

Auctions were not held because of COVID-19 pandemic situation until May,2021

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	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	12302		475	1586	3810		528		1020
%	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

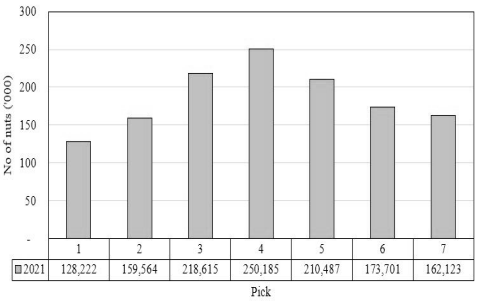


Figure 6 - Coconut production in 2021

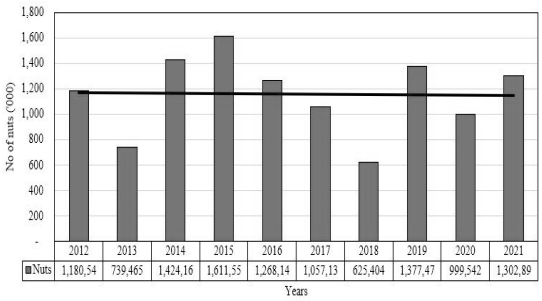


Figure 7 - Variation in coconut production in previous years

The total coconut production during the year 2021 was 1.3 million, which is a 23.3% increase compared to previous year 2020. The total number of seed nuts issued was 1.1million.

Rainfall during the year was 2078.7mm. General maintenance was done satisfactory during the year.

Annual application of fertilizer was done by covering 98% palms of the estate making advantage of both Yala and Maha rains.

Weeding, mulching and other cultural practices were duly attended.

The buffalo herd of 61 was maintained as an extensive system for grazing and thereby controlling grassy weeds with a low cost.

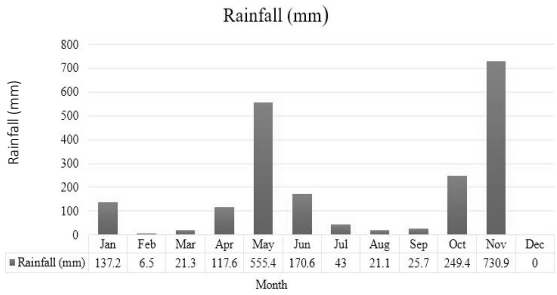


Figure 8 - Monthly rainfall (mm) in 2021

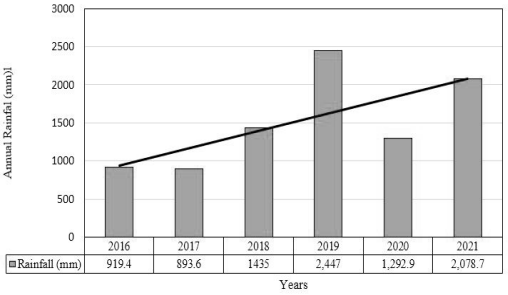


Figure 9 - Variation in annual rainfall (mm) in previous years.

Seed nuts of CRIC60 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 2021 is as follows,

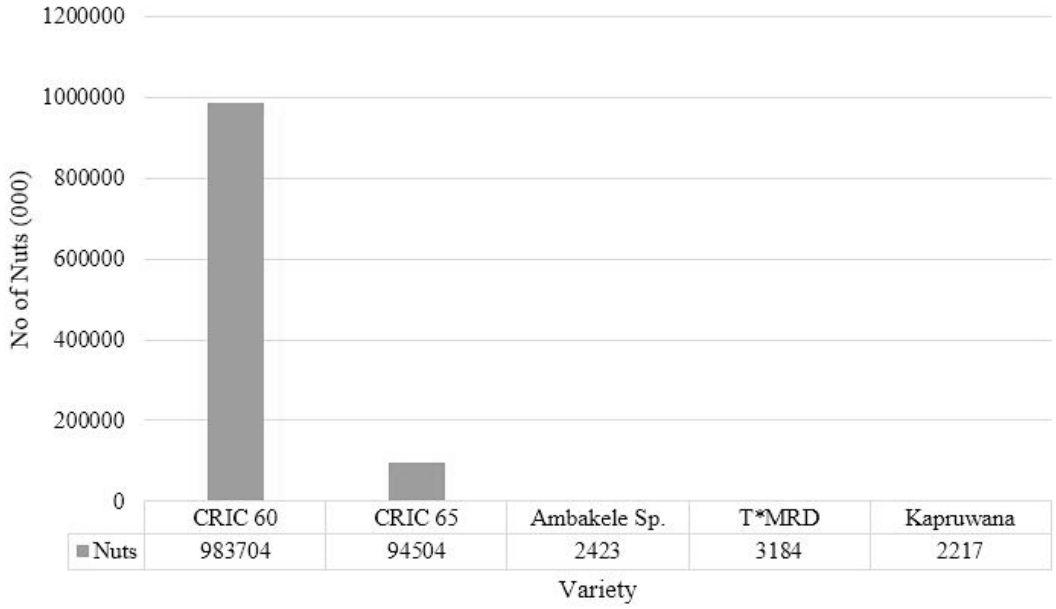


Figure 10 - Seed nut production of different varieties in 2021

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	27.27	66.45
2021	25.23	67.92

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	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	514	9325	598	507	1140	633	1088	1308	7877
%	2.23	40.56	2.6	2.2	4.95	2.75	4.73	5.68	34.26
%	42.79		4.8		4.95	47.42			

Annual census of the estate

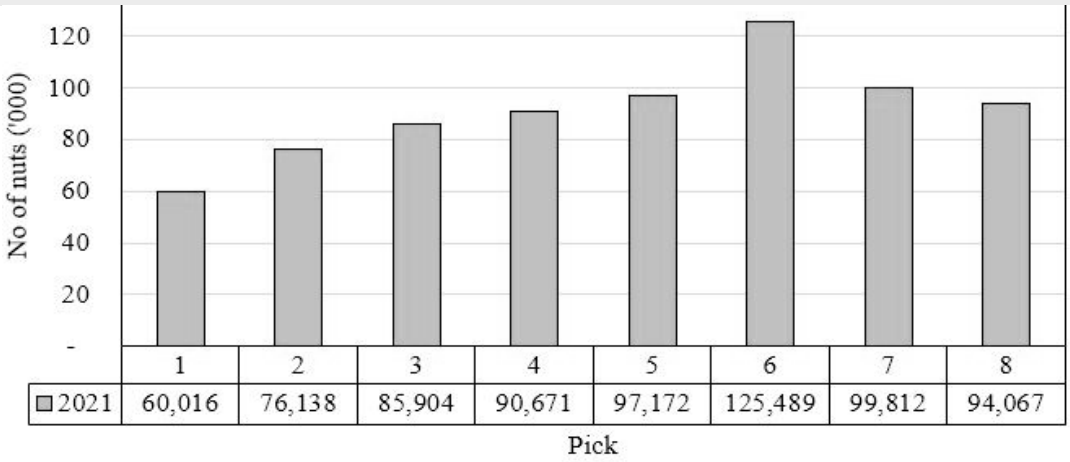


Figure 11 - Coconut production in 2021

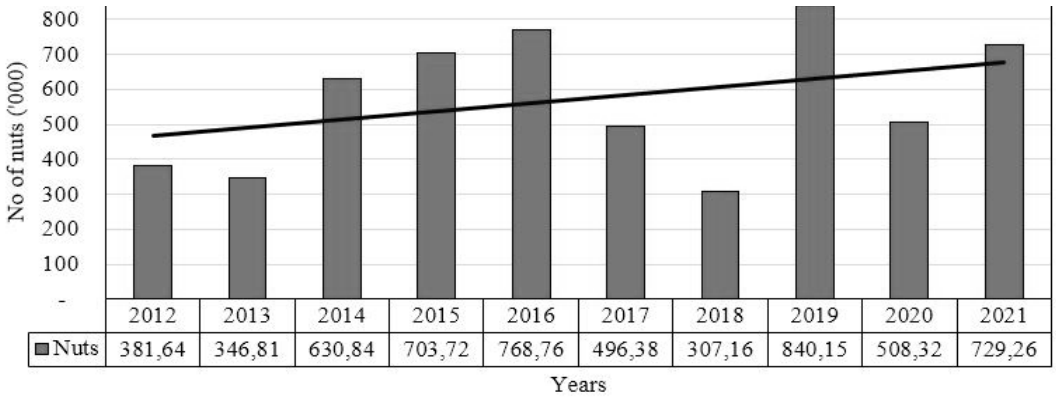


Figure 12 - Variation in coconut production in previous years.

A part of the estate was still in the developing stage as a seed garden for the mass production of seed nuts.10 acers of field No:07 were cleared to establish a new plantation.

The total production of nuts during the year 2021 was 729269. Which is a 30.3 % increase cooperated to the previous year 2020. The total number of seed nuts issued was 53,243

- TSR = 12,060
- TxDY = 29,942
- SRxDG (Kapruwana) = 1,846
- SRxDB (Kapsetha) = 2,299
- Tx DB (Kapsuwaya) = 5,505
- SRxSR = 1,591

Rainfall during the year was 1713.2mm. General maintenance was satisfactorily done during the year. Annual application of fertilizer was attended by covering 16.43% palms of the estate.

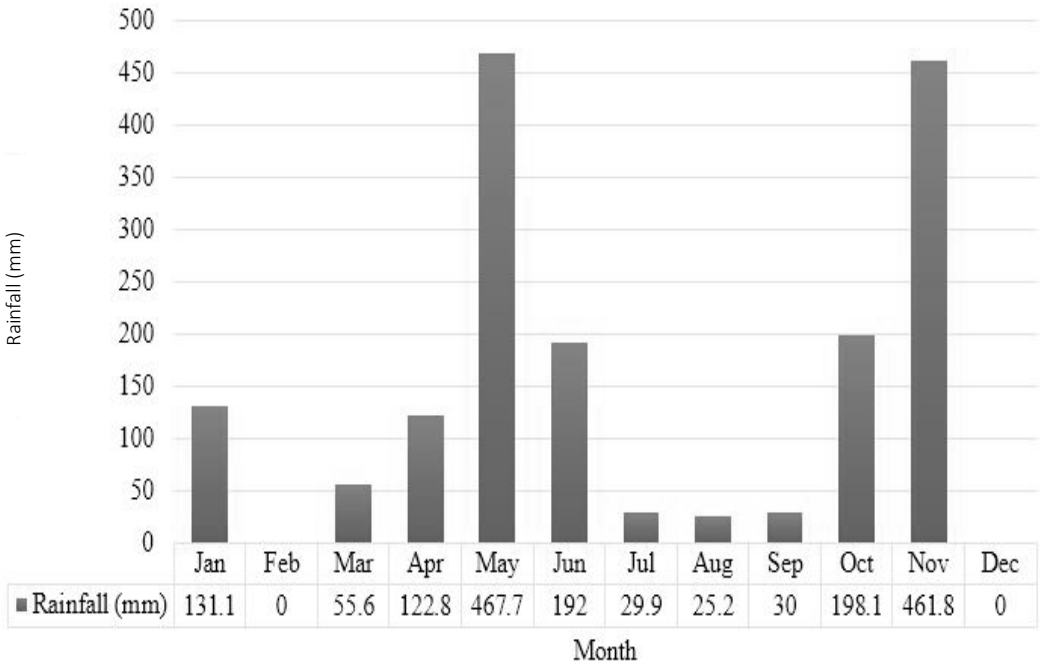


Figure 13 - Monthly rainfall (mm) in 2021

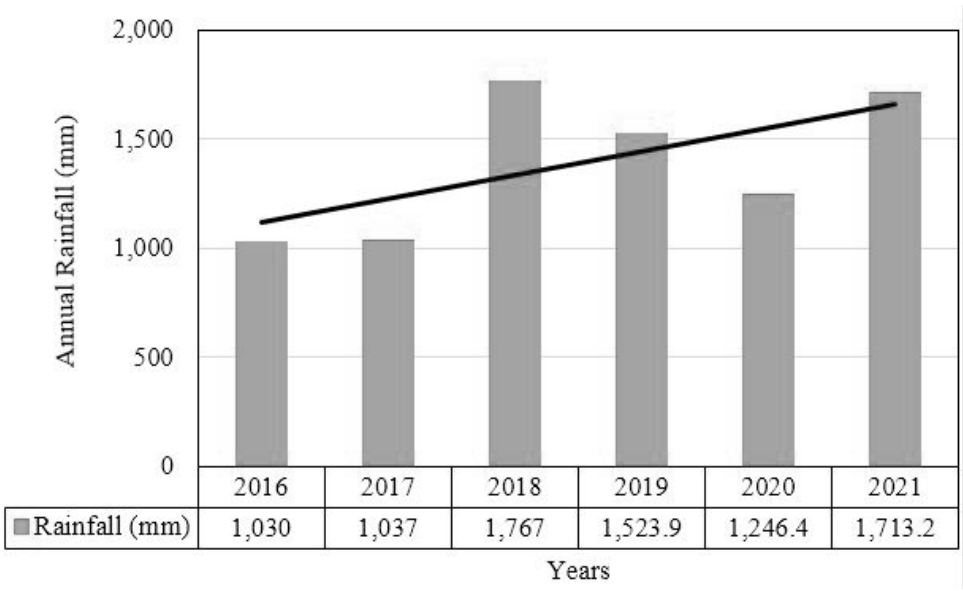


Figure 14 - Variation in annual rainfall (mm) in previous years

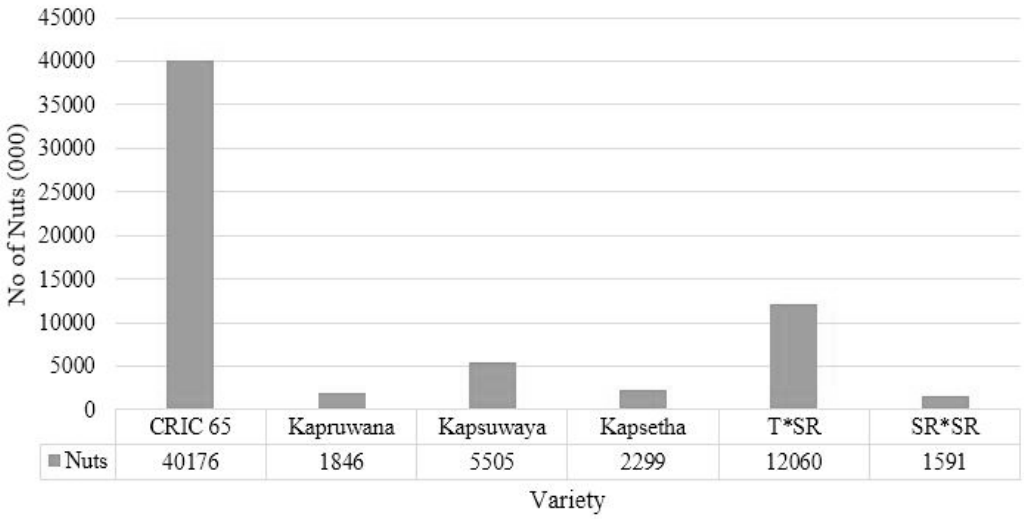


Figure 15 - Seed nut production of different varieties in 2021

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	48.12	52.27
2021	27.35	57.40

COCONUT GENETIC RESOURCE CENTRE MADURUOYA (CGRC MADURUOYA)

Agro Ecological Zone - DL2b

Extent (ac) - 205.1

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	6245	1301		40	702	38		76	1845
%	60.95	12.69		0.4	6.85	0.37		0.74	18
%	73.64		0.4		6.85	19.11			

Annual census of the estate

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 yield of coconut during the year 2021 was 669,132 nuts, which is a 60% increase in the yield comparing to previous year 2020. A total of 336,858 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 98 buffalos for breeding purpose and milk production. Rainfall during the year 2021 was 1733.2 mm. Weeding, mulching and other cultural practices were duly attended.

Annual application of fertilizer was attended by covering 74% palms of the estate making advantage of Maha rain.

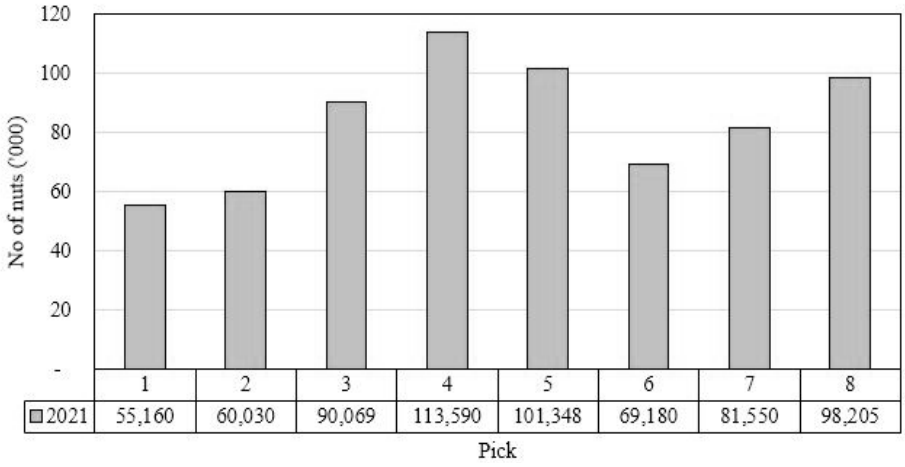


Figure 16 - Coconut production in 2021

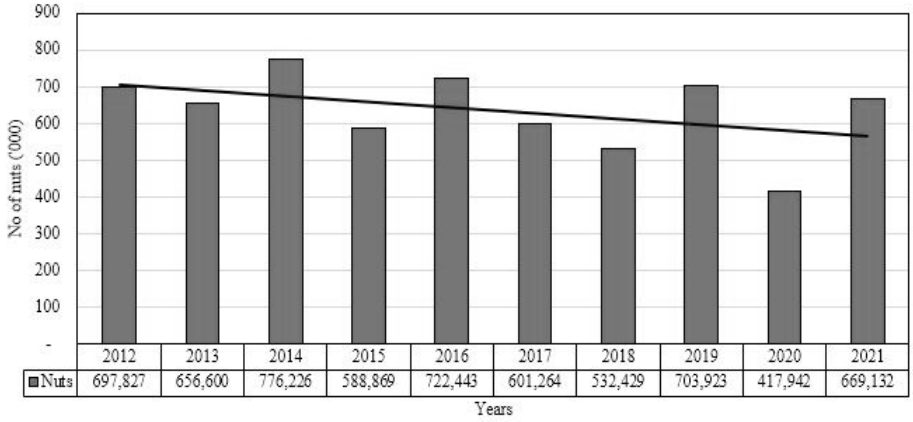


Figure 17 - Variation in coconut production in previous years

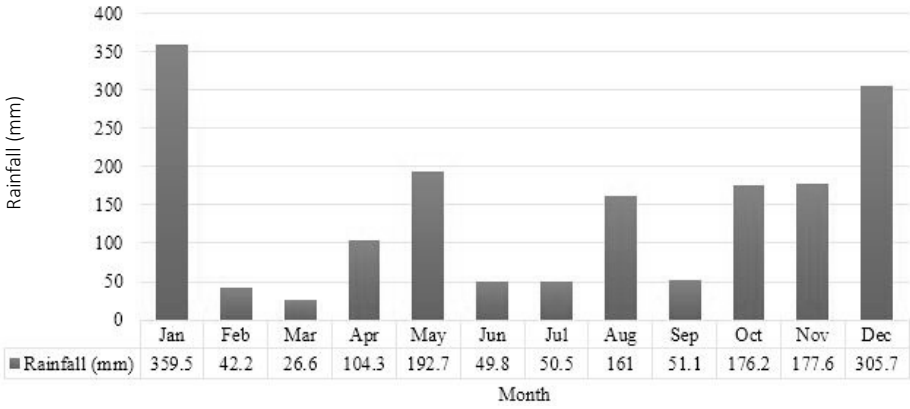


Figure 18 - Monthly rainfall (mm) in 2021

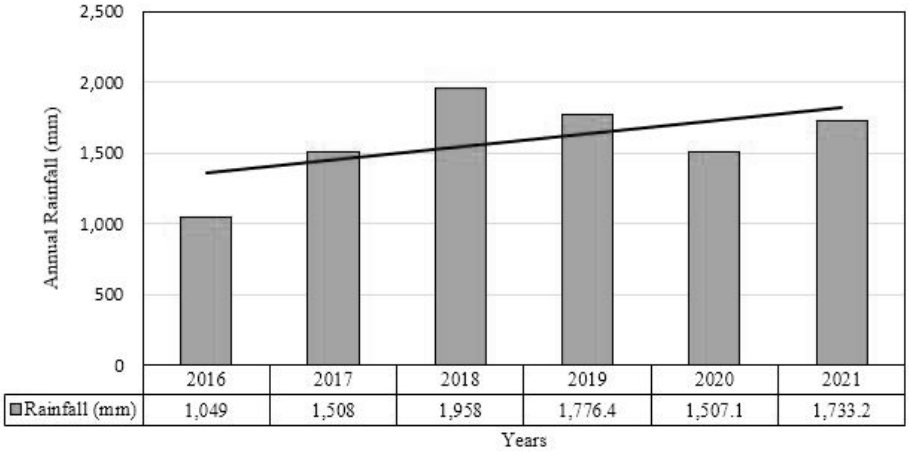


Figure 19 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	28.98	49.63
2021	17.45	64.40

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	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	2	37	19		316		31		15
%	0.48	8.81	4.5		75.24		7.39		3.58
%	9.29		4.5		75.24	10.97			

Annual census of the estate

This estate was previously managed by Coconut Cultivation Board as a coconut nursery. This land was acquired by Coconut Research Institute on lease basis at the end of year 2016. 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 wilt area.

MAKANDURA RESEARCH CENTRE

Agro Ecological Zone - IL1a

Extent (ac) - 145

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	121	5246			1354		19	155	2819
%	1.25	54			13.94		0.19	1.6	29.02
%	55.25				13.94	30.81			

Annual census of the estate

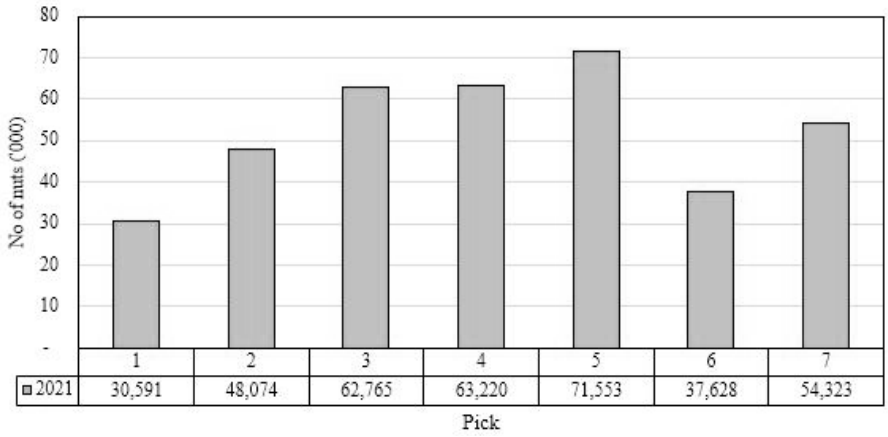


Figure 20 - Coconut production in 2021

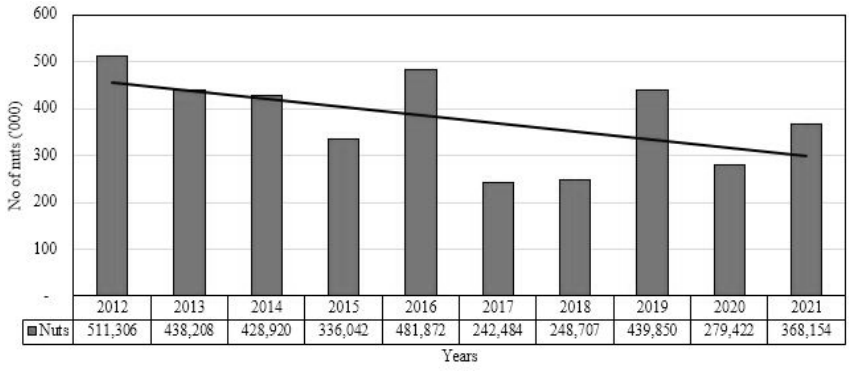


Figure 21 - Variation in coconut production in previous years

The total yield was 368,154 nuts, which is a 31.75 % increase than the previous year 2021. With regard to livestock production, this center maintained 03 cattle, 02 goats for breeding purpose and milk production.

Rainfall during the year was 2944.7 mm. General maintenance was satisfactorily done during the year.

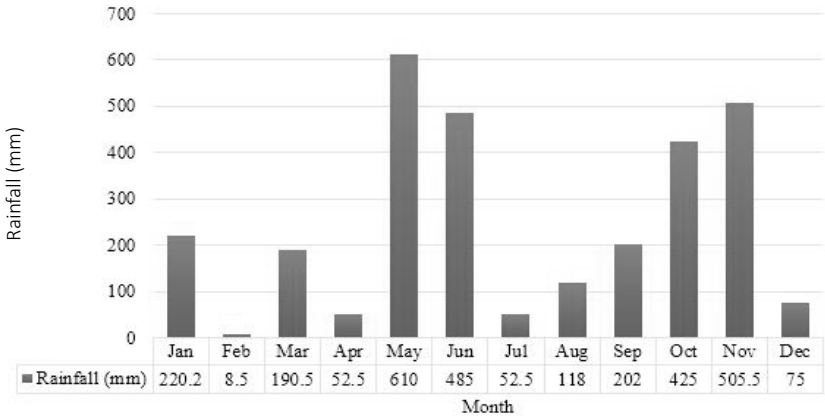


Figure 22 - Monthly rainfall (mm) in 2021

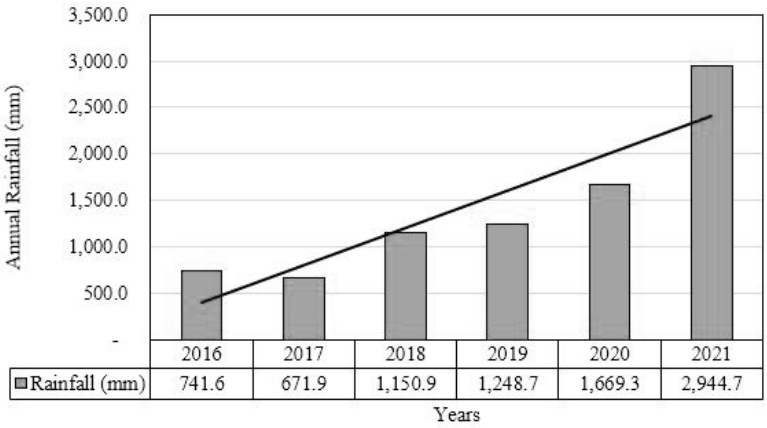


Figure 23 - Monthly rainfall (mm) in 2021

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	35.86	49.72
2021	32.13	50.65

BANDIRIPPUWA RESEARCH CENTRE

Agro Ecological Zone - IL1a

Extent (ac) - 360.16

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms		10187	333	172	677	93	1321	442	436
%		74	2.44	1.25	4.95	0.69	9.66	3.24	3.2
%	74.56		3.69		4.95	16.79			

Annual census of the estate

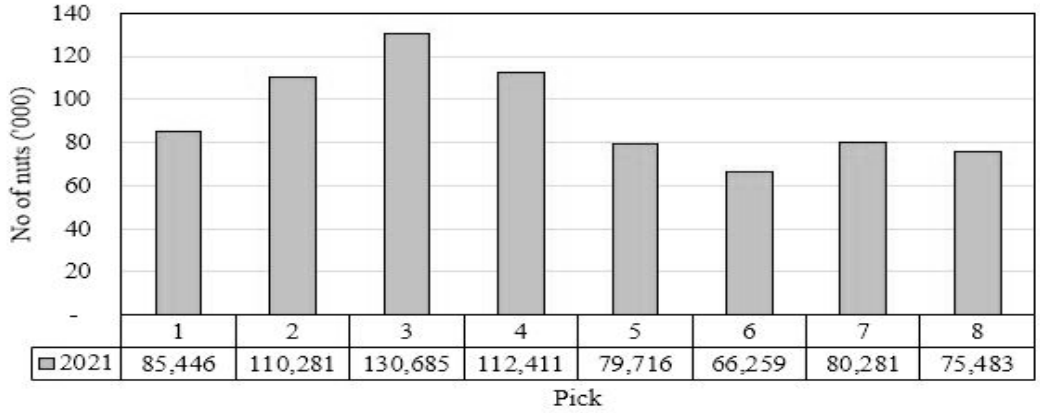


Figure 24 - Coconut production in 2021

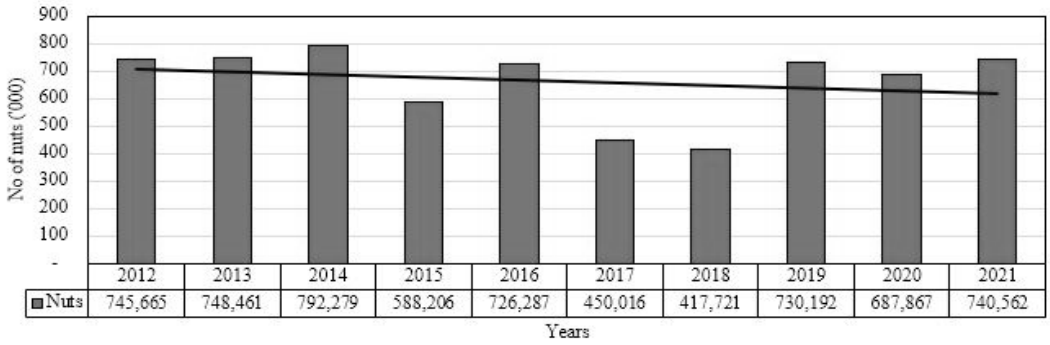


Figure 25 - Variation in coconut production in previous years

The total yield of coconut during the year was 740,562 nuts, which is a 7.6 % increase compared to the 2020. Rainfall during the year was 3018 mm. Application of fertilizer was made by covering 62 % 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 was renovated during the year. Livestock consisting of 92 cattle and 46 buffalos were maintained successfully to production of milk. Technology Park was successfully maintained in field No.07 adjoining Kuliyapitiya road.

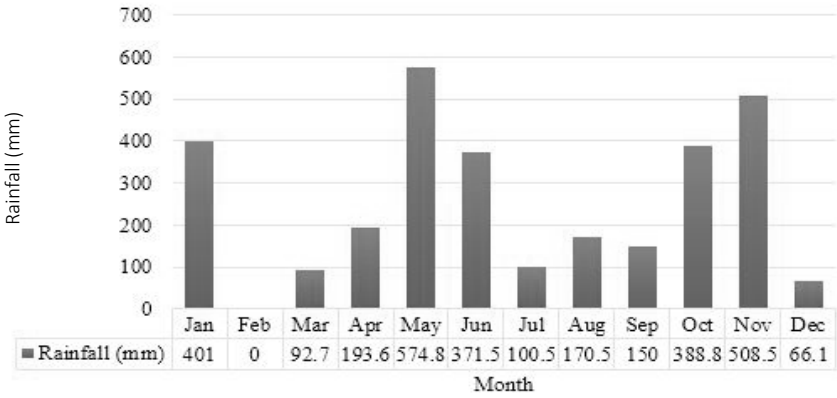


Figure 26 - Monthly rainfall (mm) in 2021

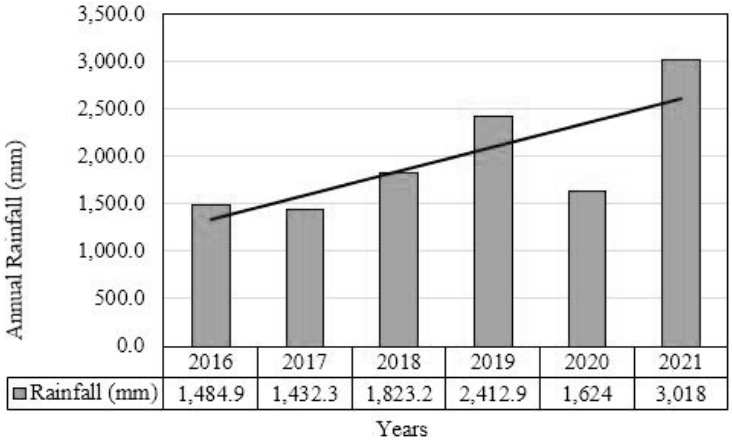


Figure 27 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	28.24	48.96
2021	26.96	54.44

RATHMALAGARA RESEARCH CENTRE

Agro Ecological Zone - IL1a

Extent (ac) - 251.1

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms		9213	2	165	2002			1221	4867
%		52.73	0.01	0.94	11.45			7.19	27.85
%	52.73		0.95		11.45	35.04			

Annual census of the estate

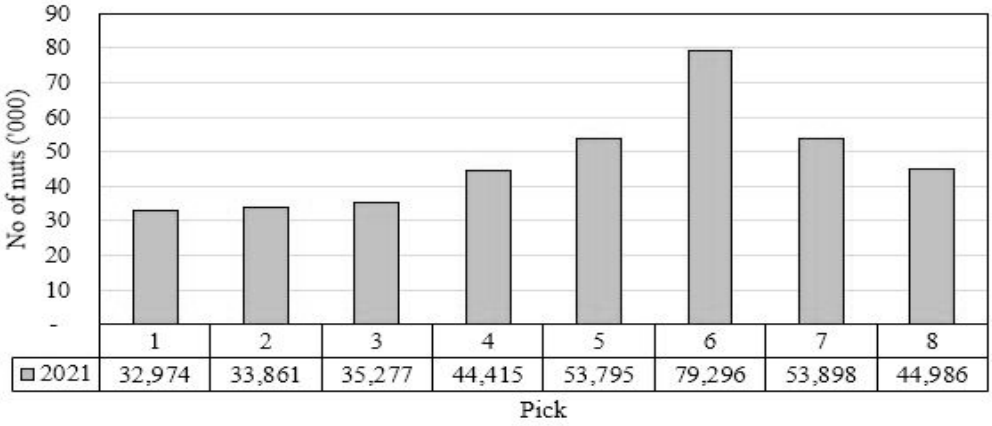


Figure 28 - Coconut production in 2021

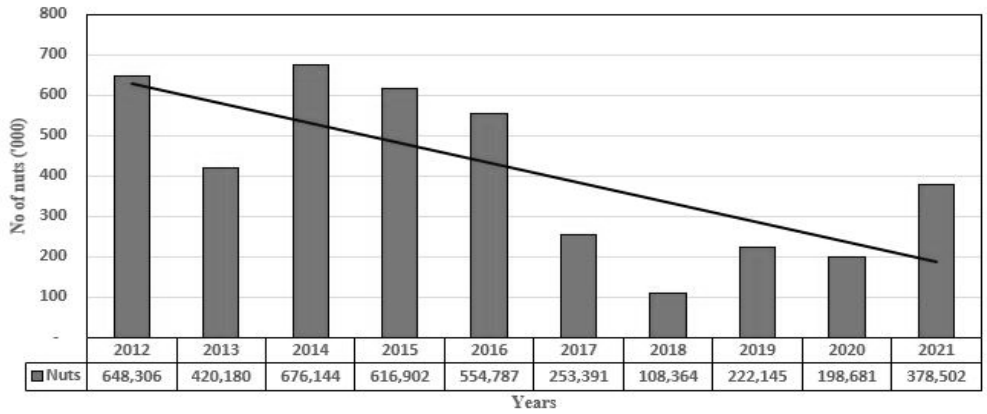


Figure 29 - Variation in coconut production in previous years

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 378,502 nuts in the year 2021, and it is a 91% increase compare to 2020.

Rainfall during the year 2021 was 2037.2 mm. Livestock consisting of 11 cattle, 17 goats, 40 sheep and12 hens were maintained successfully. Application of fertilizer were made by covering 77% of palms. Weeding, mulching and other cultural practices were duly attended.

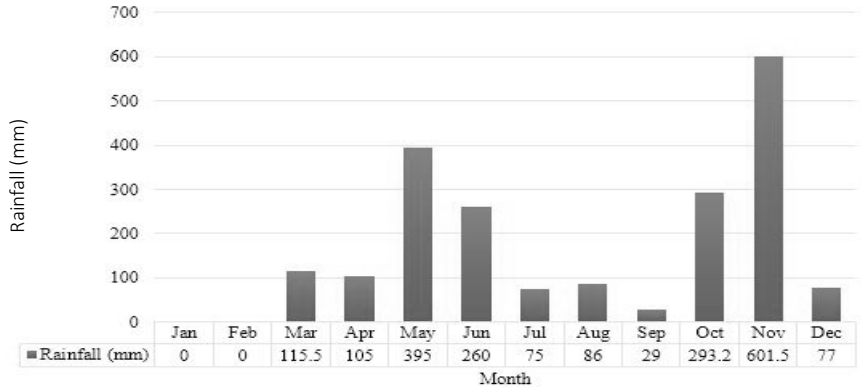


Figure 30 - Monthly rainfall (mm) in 2021

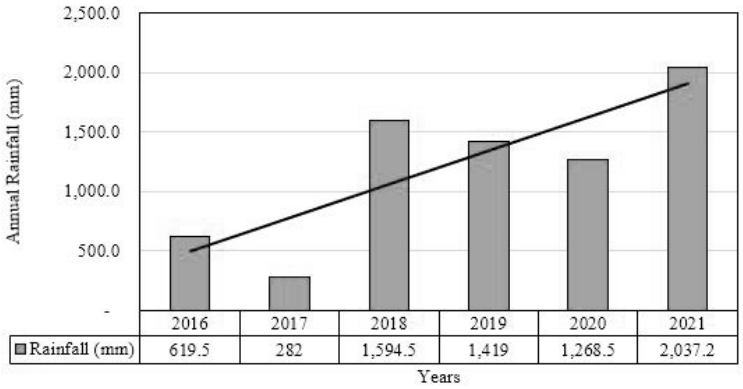


Figure 31 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	59.52	42.99
2021	33.17	47.48

POTHTHUKULAMA RESEARCH CENTRE

Agro Ecological Zone - IL1b

Extent (ac) - 194

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	232	8317	57	33	31		529	362	3964
%	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 census of the estate

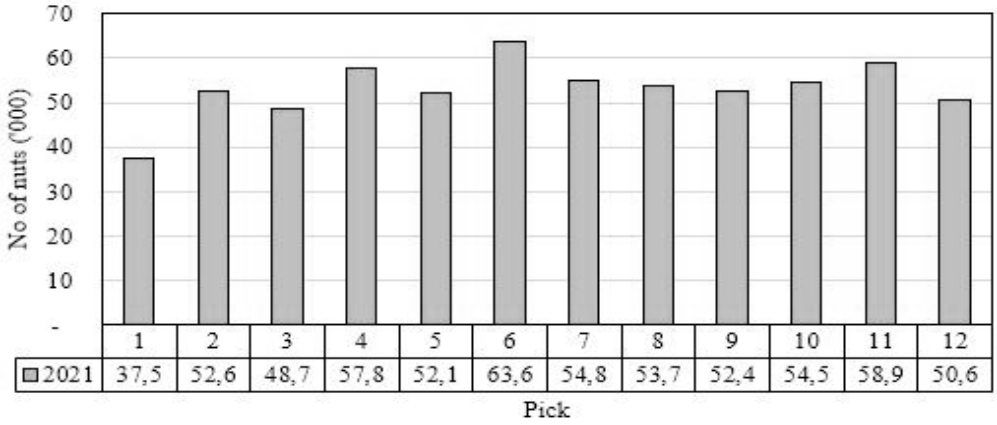


Figure 32 - Coconut production in 2021

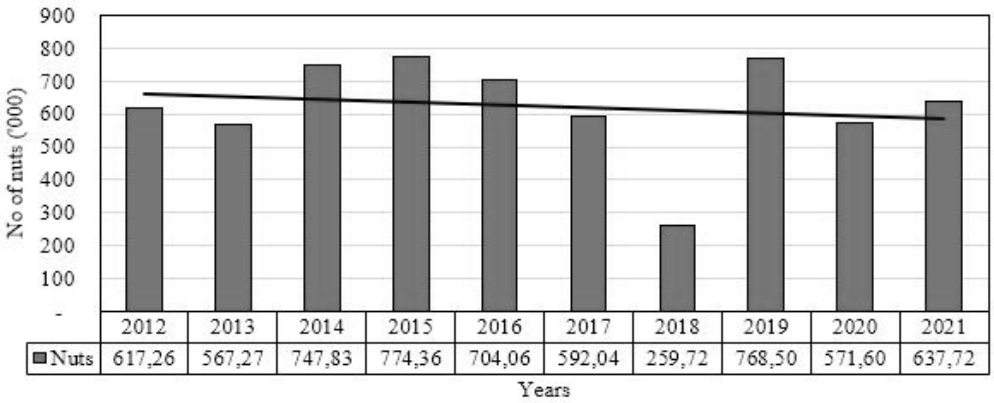


Figure 33 - Variation in coconut production in previous years

The coconut production at Pothukulama Research Center was 637,728 nuts and it was a 12% increase compared to the 2020.

Rainfall during the year was 1767.1 mm. This estate is used for research activities and a collection of dwarf varieties is maintained in a separate block.

Routine activities were continued successfully. 76% palms of the estate have been fertilized.60 cattle and 16 buffalos were maintained during the year. Weeding, mulching and other cultural practices were duly attended.01 acre of Turmeric was established as an intercrop.

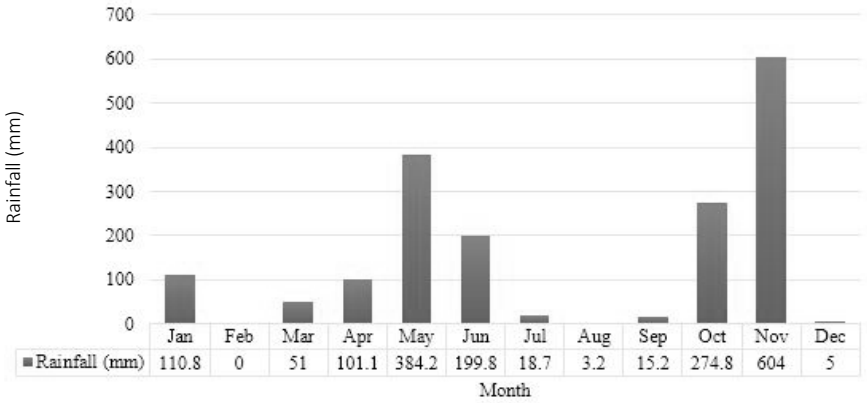


Figure 34 - Monthly rainfall (mm) in 2021

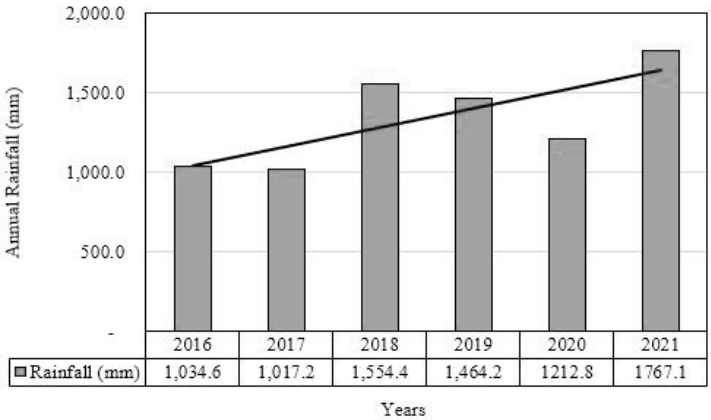


Figure 35 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	21.18	47.04
2021	19.27	56.77

WALPITA RESEARCH CENTRE

Agro Ecological Zone - WL3

Extent (ac) - 40

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	819		540	520	50	197		35	400
%	31.9		21.08	20.3	1.95	7.69		1.36	15.61
%	31.9		41.38		1.95	24.66			

Annual census of the estate

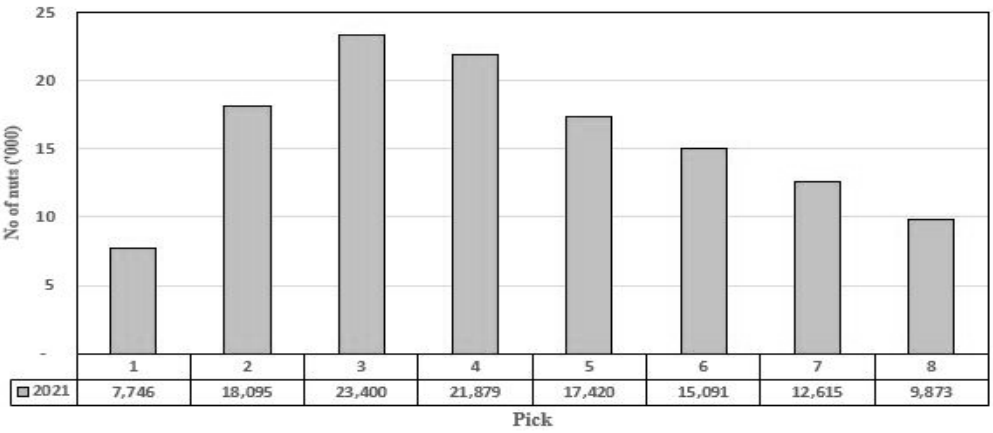


Figure 36 - Coconut production in 2021

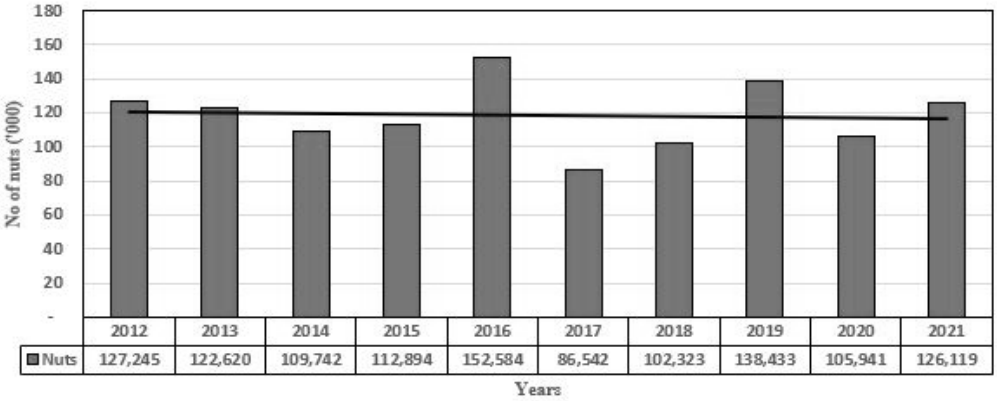


Figure 37 - Variation in coconut production in previous years

This research station was maintained specially for the demonstration purpose of coconut varieties and intercrops.

The estate gave an annual crop of 126,119 nuts in 2021 and it is a 19.04% increase compared to 2020. Rainfall during the year was 2464.3 mm. Out of the above nut production 29139 seed nuts were issued which were separately collected from plus palms. Weeding, mulching and other cultural practices were duly attended.

01 acre of Turmeric and 01 acre of Cinnamon were established as intercrops. New plantation of 100 seedlings were established in 2021.

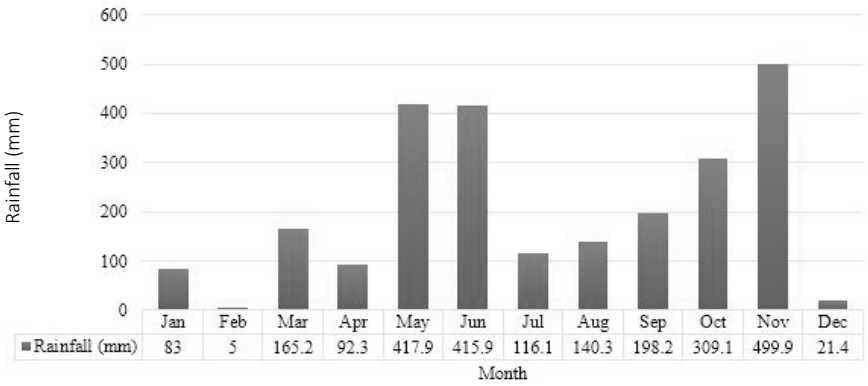


Figure 38 - Monthly rainfall (mm) in 2021

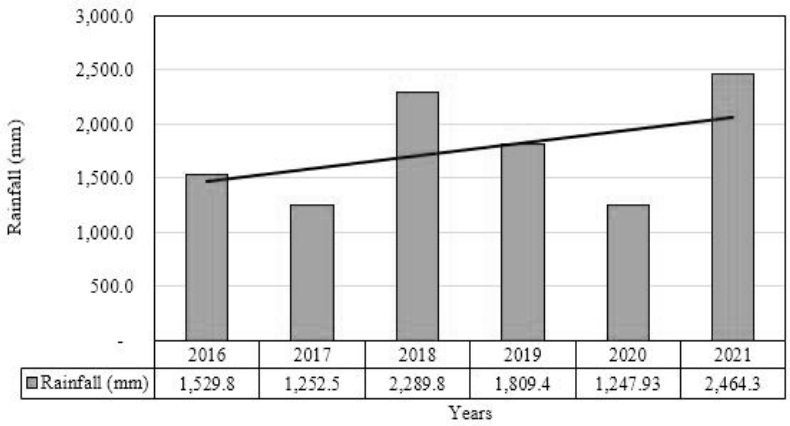


Figure 39 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	34.81	42.56
2021	28.15	51.68

MIDDENIYA RESEARCH CENTRE

Agro Ecological Zone - IL1b

Extent (ac) - 75.55

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms		2633		113	722				
%		75.92		3.25	20.81				
%	75.92		3.25		20.81				

Annual census of the estate

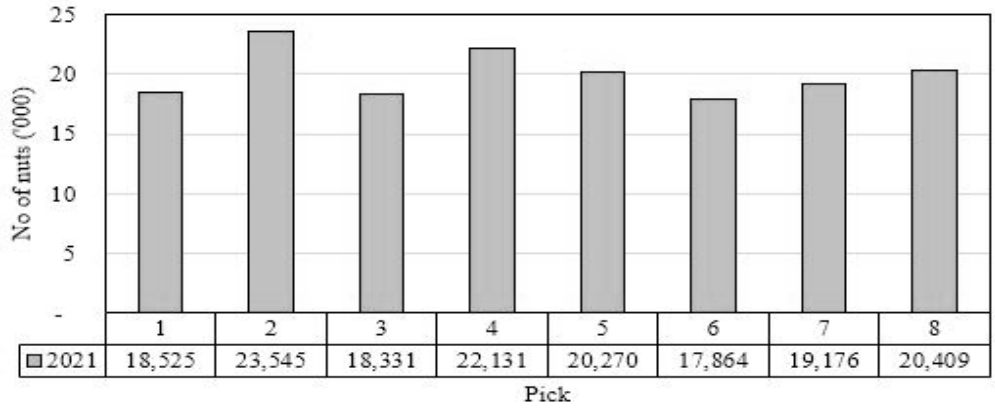


Figure 40 - Coconut production in 2021

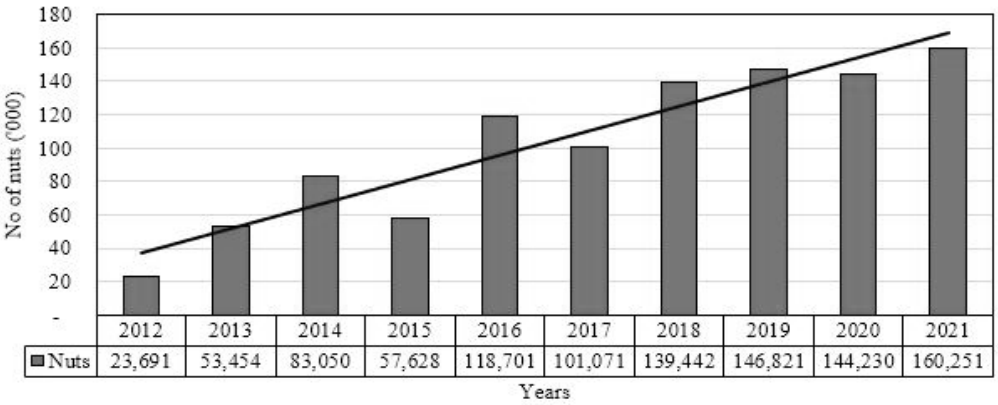


Figure 41 - Variation in coconut production in previous years

The research center is still in the developing stage with the establishment of new varieties. A total of 3,468 coconut seedlings of different cultivars were established and 80% of them were came to bearing state.

Middeniya Reseach 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 144,230 nuts in 2021 and it is 11.1% increase compared to 2020.

Rainfall during the year was 996 mm. General maintenance was satisfactorily done during the year. Annual application of fertilizer was attended by covering all the palms. In this year, 02 acres of turmeric ware cultivated.

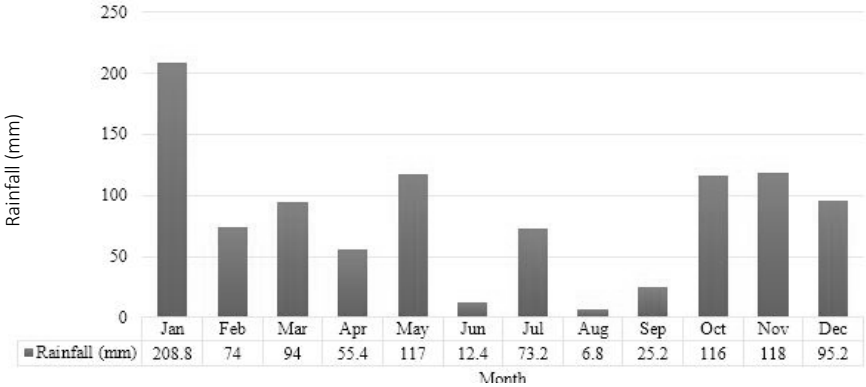


Figure 42 - Monthly rainfall (mm) in 2021

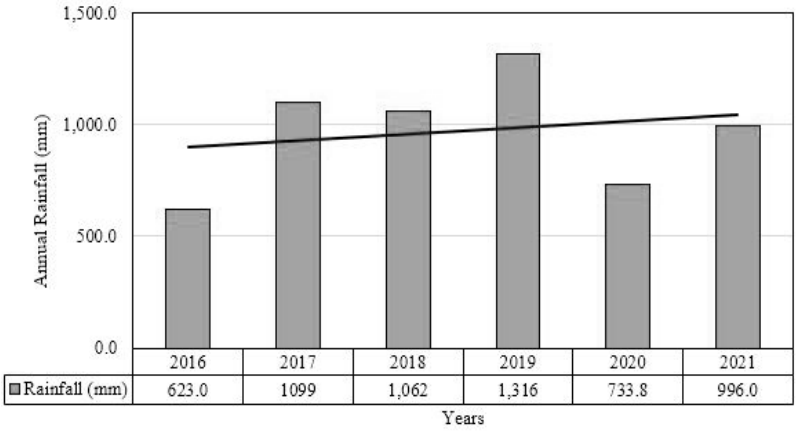


Figure 43 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	41.17	47.92
2021	39.33	49.97

THABBOWA RESEARCH CENTRE

Agro Ecological Zone - IL1a

Extent (ac) - 6.96

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Unproductive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of palms	340		49	47	9				
%	76.4		11.01	10.56	2.03				
%	76.4		21.57		2.03				

Annual census of the estate

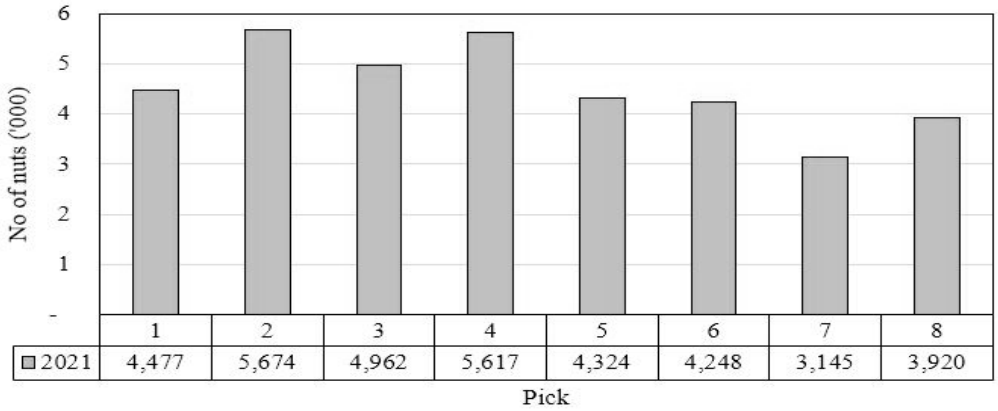


Figure 44 - Coconut production in 2021

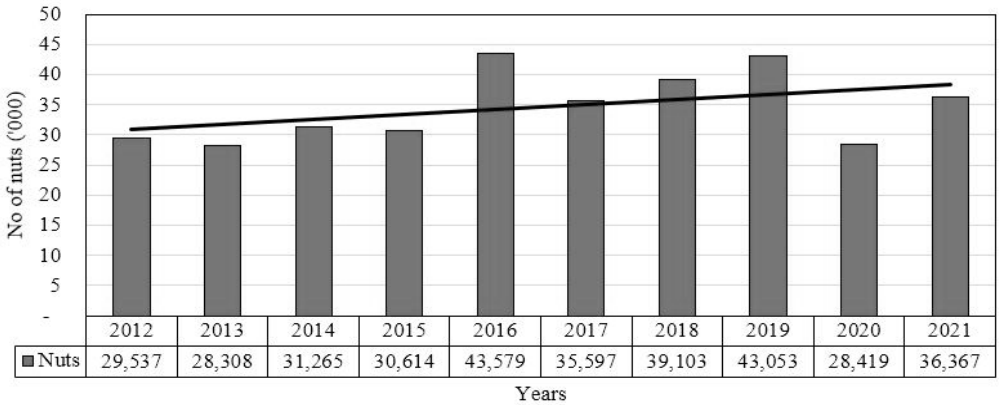


Figure 45 - Variation in coconut production in previous years

This research center was maintained specially for the demonstration purpose of intercrops. Thabbowa Research Center gave an annual crop of 36,367 nuts in the year and it is a 27% increase compared to 2020.

Rainfall during the year was 1,763.6 mm. Weeding, mulching and other cultural practices was satisfactorily done during the year. Annual application of fertilizer was attended by covering all the palms.

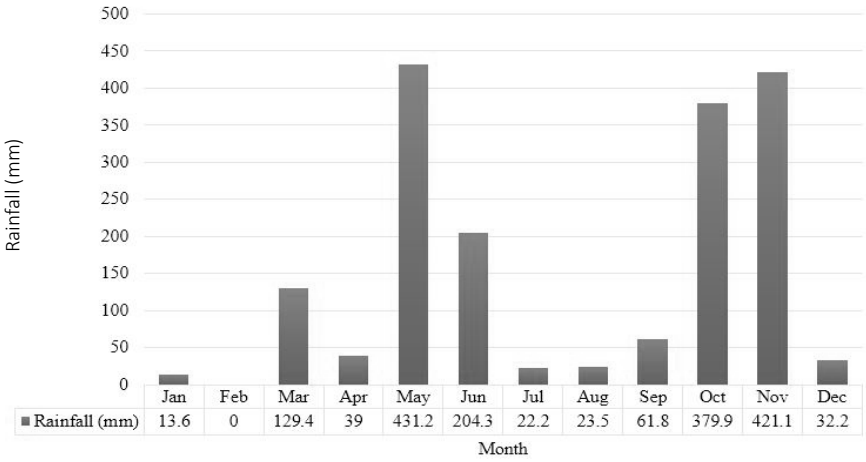


Figure 46 - Monthly rainfall (mm) in 2021

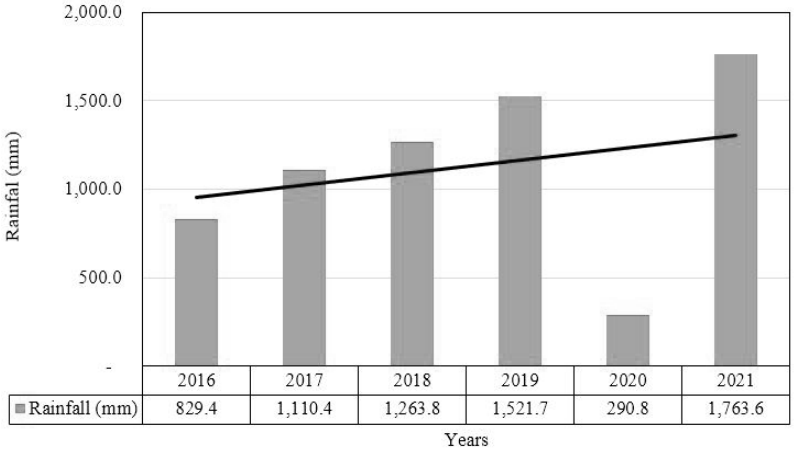


Figure 47 - Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA / Nut (Rs)
2020	29.40	43.30
2021	28.91	56.22

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- K.P.I.E. Ambagala, Dip. (Agric)
- K.P.A. Pathirana, Dip. (Agric)
- B.S.V.J. Perera, Dip. (Agric)
- Mrs. H.L.A. Padmini, Dip. (Agric)

Technical Officers

- Ms. K.D.C. Premarathna, HND. (Agric. Production Technology)
- Mrs R.K.K.H.J. Jayasinghe, Dip. (Agric)
- K.M.P.C. Warnasooriya, HND. (Agric. Production Technology)
- D.C.D. Perera, HNDT (Agric)
- 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
- R.M.N. Sandasiri
- Lab & Field Attendant
- W.R.P. Tissera
- L.M.G.D. Liyanage
- 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

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)

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

- J.A.D. Madusanka, HNDT (Agric)
- Mrs. C.A.T.D. Chandrapeli, HNDT (Agric)
- Mrs. M.I. Senarathne, Dip (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)

Senior Research Officer

- M.D.P.Kumarathunga, B.Sc (Agric), PhD (Westerb Sydney University)

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
- Mrs. T.S. Abeyratne
- H.M.S. Nayanakumara

General Woker (Office Attendant)

- J.A.R. Malintha

AGRICULTURAL ECONOMICS AND AGRIBUSINESS MANAGEMENT DIVISION

I.M.S.K. Idirisinghe - *Head*

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

Senior Research Officers

- Mrs. K.V.N.N. Jayalath, B.Sc. (Agric),
- M.Phil. (Quneensland, Australia)

Lab & Field Assistant

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

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)

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)
- K.M.R.T. Wijekoon, B.Sc (Botany), M.Sc (Peradeniya)
- Mrs. W.G.R. Subhathma, B.Sc (Agric), M.Sc (Ruhuna)

Experimental Officer

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

Experimental Officer(Tamil Medium)

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

Assistant Extension Officer

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

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

LIBRARY

Mrs. P.D.U.C. Dharmapala - *Librarian*

FELE, BLE

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)

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.K.S. Senarath
- D.W.K. Madushanka
- M.P.S. Fernando
- Mrs. H.D. Suseetha
- Mrs. R.D. Shiroma
- W.A.T. Arunasiri

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

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
- M.M.L. Silva, B.Sc. (Entrepreneur)

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
- R.K.S. Wimalasiri
- 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 (Civil)

- R.M.R.G. Nawarathna, Dip. Engineering Sciences

Technological Officer (Electrical)

- G.L.U.S. Gunawardhane, HND in Engeenering (Electrical)

Management Assistant (Auditing)

- H.S.S.S. De Seram, AAT

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

Building Helper

- K.J.J. Appuhamy
- R.P.S.J. Manchanayake

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

ESTATE MANAGEMENT DIVISION

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

B.Sc. (Agric)

Senior Management Assistants

- Mrs. M.G. Karunawathie

Management Assistants (Accounting)

- Mrs H.A.N. Subhashini

General Woker (Office Attendant)

- P.V.N.W. Kumara

BANDIRIPPUWA RESEARCH CENTER

Estate Superintendent

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

Assistant Estate Superintendent

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

Field Officer

- P.A.K. Sanjeewa, HND (Agri. Produc. Tech.)

Management Assistant

- Ms. R.P.W. Sanderenu

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
- I.R.I.U Gunawardhana

AMBAKELLE COCONUT GENETICS RESOURCE 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 COCONUT 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 COCONUT GENETICS RESOURCE 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 RESEARCH CENTRE

Estate Superintendent

I.A.N. Hemasiri

Field Officer

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

General Woker (Office Attendant)

- Mrs. P.M. Kamalawathie

PALLAMA COCONUT GENETICS RESOURCE CENTRE

Estate Superintendent

J.A.S.C. Jayakodi, B.Sc.in Agricultural Resource Mgt. & Tech.

Field Officer

- E.G.P.S. Somarathne, HND (Agri. Produc. Tech.)

Field Supervisor

- M.A.S. Ayshan.
- S.M.J.P. Senarathne

Lab & Filed Attendant

- Mrs. S.A. Sumanawathie
- J.M.C.P. Jayamanna

Driver

- H.M.D.N. Herath

Walpita Research Centre

Officer-in-Charge

T.M.N. Menaka, Diploma in Plantation Management, B.Sc. in Agri. & Plant. Mgt.

Thabbowa Demonstration Farm

Officer-in-Charge

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

* Study Leave

** No pay Leave

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 1. Staff Cadre as at 31.12.2021

Salary Code	Appr.	Exis.	Vacancies
HM 2-3	01	01	00
HM 2-1	01	01	00
HM 1-3	19	9	10
HM 1-1	01	00	01
MM 1-2	07	05	02
AR 2	14	06	08
AR 1	26	23	03
JM 1-2	15	13	02
MA 4	28	28	00
MA 3	05	04	01
MA 2-2	59	43	16
MA 1-2	85	53	32
PL 3	39	23	16
PL 2	53	33	20
PL 1	38	34	04
	391	**276**	**115**

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 29 employees, amounting to Rs.7,149,960.00

Transport Loans : Granted for 10 employees, amounting to Rs. 350,000.00

3.2 Other facilities to employees

Financial assistance was also granted to Day Care Centre Rs.12,000.00, Death Donation Society Rs. 50,000.00, Art Circle Rs. 15,000.00 and the Recreation Club Rs. 30,000.00 during the year 2021.

STAFF MATTERS

4. APPOINTMENTS

Following appointments were made during the year 2021, and the details are given in Table 2.

Table 2. Total No. of appointments: 48

Name	Designation	Division / Unit	Date
Dr. M.D.P. Kumarathunge	Senior Research Officer	Plant Physiology Division	19.02.2021
Mr. M.A.N.A. Kumara	Technical Officer	Agricultural Economics & Agribusiness Management Division	12.03.2021
Mrs. E.M.N. Madhuwanthi	Technical Officer	Crop Protection Division	12.03.2021
Mr. T.M.N.K. Gunarathne	Technical Officer	Agronomy Division	12.03.2021
Miss K.A.D.R.C. Kodikara	Technical Officer	Tissue Culture Division	12.03.2021
Mr. K.M.P.C. Warnasooriya	Technical Officer	Soils & Plant Nutrition Division	12.03.2021

Name	Designation	Division / Unit	Date
Miss A.M.T.B. Amarasekara	Technical Officer	Agricultural Economics & Agribusiness Management Division	12.03.2021
Mrs. B.M.A.U. Amarathunga	Technical Officer	Genetics & Plant Breeding Division	15.03.2021
Mr. D.W.L. Lilruksha	Technical Officer	Coconut Processing Research Division	19.04.2021
Mr. D.R.S. Wijegunathilake	Estates Superintendent	Estates Management Division	28.06.2021
Mr. D.C.D. Perera	Technical Officer	Soils & Plant Nutrition Division	28.06.2021
Mr. B.U.C. Samarakoon	Estates Superintendent	Estates Management Division	28.06.2021
Mr. P.D.R.S. Appuhamy.	Field Supervisor	Estates Management Division	28.06.2021
Mr. M.A.S. Ayshan.	Field Supervisor	Estates Management Division	01.07.2021
Mr. W.W.M.S.N. Wasalage.	Field Supervisor	Estates Management Division	05.07.2021
Mr. K.A.G.P. Rathnaweera.	Field Supervisor	Estates Management Division	05.07.2021
Mr. H.R.I.U. Gunawardhana.	Field Supervisor	Estates Management Division	05.07.2021
Mr. S.M.J.P. Senarathne	Field Supervisor	Estates Management Division	19.07.2021
Dr. N.S. Aratchige	Deputy Director (Research)	Establishment Division	26.07.2021
Mr. P. Majuran	Experimental Officer (Tamil Medium)	Technology Transfer Division	02.08.2021
Mr. G.L.U.S. Gunawardhane	Technological Officer (Electrical)	Engineering Division	02.08.2021
Dr. K.P. Waidyarathne	Principal Research Officer	Plant Physiology Division	31.08.2021
Dr. A.A.A.J. Atapattu	Senior Research Officer	Agronomy Division	12.11.2021

Name	Designation	Division / Unit	Date
Mr. T.M.N. Menaka	Assistant Estates Superintendent	Estates Management Division	15.11.2021
Mr. J.A.S.C. Jayakody	Estate Superintendent	Estates Management Division	15.11.2021
Miss A.D.T.D.S. Kulasingha	Technical Officer	Crop Protection Division	15.11.2021
Miss S.D.Y. Nuwanthika	Technical Officer	Soils & Plant Nutrition Division	15.11.2021
Mr. R.P.G.C.S. Kumara	Assistant Estates Superintendent	Estates Management Division	22.11.2021
Mr. R.M.R.G. Nawarathna	Technological Officer (Civil)	Engineering Division	22.11.2021
Mrs. R.D.S. Priyadarshani	Management Assistant (Book Keeper)	Accounts Division	15.12.2021
Miss P.M.M. Fernando	Research Officer	Agricultural Economics & Agribusiness Management Division	15.12.2021
Mrs. A.A.R.W. Abeysinghe	Research Officer	Soils & Plant Nutrition Division	15.12.2021
Mrs. D.H. Dilrukshika	Research Officer	Crop Protection Division	16.12.2021
Miss D.P.M. Silva	Research Officer	Crop Protection Division	16.12.2021
Miss M.T.N. Indrachapa	Research Officer	Tissue Culture Division	16.12.2021
Mr. M.G.O.S. Thilakarathne	Research Officer	Genetics & Plant Breeding Division	20.12.2021
Mr. B.H.N.M.R. Gunasena	Assistant Seed & Seedling Production & Certification Officer	Genetics & Plant Breeding Division	20.12.2021
Mr. H.M.N.B. Herath	Experimental Officer	Genetics & Plant Breeding Division	28.12.2021
Mrs. H.L.A. Pathmini	Experimental Officer	Soils & Plant Nutrition Division	28.12.2021
Mr. B.S.V.J. Perera	Experimental Officer	Soils & Plant Nutrition Division	28.12.2021

Name	Designation	Division / Unit	Date
Mr. S.A.S. Chandrasiri	Experimental Officer	Genetics & Plant Breeding Division	28.12.2021
Mr. A.P.C. Pradeep	Experimental Officer	Plant Physiology Division	28.12.2021
Mr. A.A. Fernando	Experimental Officer	Genetics & Plant Breeding Division	28.12.2021
Mr. S.P. Manoj	Experimental Officer	Crop Protection Division	28.12.2021
Mrs. T.M.S.G. Weerasinghe	Experimental Officer	Coconut Processing Research Division	28.12.2021
Mr. J.A.A. Gunasekara	Experimental Officer	Agronomy Division	28.12.2021
Mrs. P G K Perera	Experimental Officer	Tissue Culture Division	28.12.2021
Mr. T.D. Nuwarapaksha	Research Officer	Agronomy Division	31.12.2021

5. RESIGNATIONS, RETIREMENTS & DEATHS

The details are given in Table 3

Retirements

Table 3. Total No. of retirements: 10

Name	Designation	Division/Unit	Date
Mr. A.G.B.G. Silva	Senior Field Supervisor	Estates Management Division	15.01.2021
Mr. W.A.S.S. Weerasinghe	Senior Electrician	Engineering Division	15.04.2021
Mr. J.A.D.B.D. Appuhamy	Driver	Establishment Division	19.04.2021
Mr. D.P.S.K. Hettiarachchi	Estates Superintendent	Estates Management Division	16.05.2021
Mr. A.K.D.L. Jayatissa	General Worker (Office Attendant)	Agronomy Division	17.05.2021
Dr. H.T.R. Wijesekara	Head of Division	Crop Protection Division	11.06.2021

Name	Designation	Division/Unit	Date
Mr. E.S. Santha	Experimental Officer	Tissue Culture Division	02.07.2021
Mrs. U.I. Abeysinghe	Senior Management Assistant (Clerical)	Establishment Division	05.08.2021
Mr. K.K. Piyatissa	Driver	Estates Management Division	21.08.2021
Mr. W.M.R. Sisira	Lab & Field Attendant.	Engineering Division	29.09.2021

Resignations

Table 4. Total No. of resignations : 08

Name	Designation	Division/Unit	Date
Mrs. W.M.K. Lakdusinghe	Research Officer	Coconut Processing Division	29.01.2021
Mr. N.A.U.S. Nikapitiya	Technical Officer	Agricultural Economics & Agribusiness Management Division	06.02.2021
Mr. H.G.C.W. Gamage	Field Officer	Estates Management Division	15.02.2021
Mrs. T.A.K. Vidanage	Technical Officer	Soils & Plant Nutrition Division	18.02.2021
Dr. M.G.M.K. Meegahakumbura	Senior Research Officer	Genetics & Plant Breeding Division	13.10.2021
Mrs. H.M.S.K. Herath	Management Assistant (Clerical)	Plant Physiology Division	30.10.2021
Mr. M.A.L. Tharaka	Estates Superintendent	Estates Management Division	08.11.2021
Mr. S.A.S.T. Raveendra	Research Officer	Agronomy Division	13.12.2021

Deaths

Table 5. Total No. of deaths : 01

Name	Designation	Division/Unit	Date
Mr. M.A.S. Chandana	General Worker (Office Attendant)	Crop Protection Division	16.12.2021

6. PROMOTIONS

6.1 PROMOTIONS IN NON-EXECUTIVE GRADES

Promotions in Non-Executive grades were not made during the year 2021.

6.2 PROMOTIONS IN EXECUTIVE GRADES

Promotions in Executive grades were not made during the year 2021.

7. TRANSFERS

Table 6. Total No. of transfers : 05

Name & Designation	Place of Transfer (From/To)	Effective Date
Mr. S.A.S. Chandrasiri Technical Officer	From Establishment Unit to Genetics & Plant Breeding Division	11.10.2021
Mr. H.S.S.S. De Seram Management Assistant (Auditing)	From Internal Audit Unit to Engineering Unit	16.11.2021
Mr. K.J.J. Appuhamy General Worker (Building Helper)	From Engineering Unit to Establishment Unit	06.12.2021
Mr. R.P.S.J. Manchanayake General Worker (Building Helper)	From Engineering Unit to Establishment Unit	06.12.2021
Mr. R.M.R.G. Nawarathne Technological Officer (Civil)	From Engineering Unit to Establishment Unit	06.12.2021

8. LOCAL TRAININGS (More than 7 days)

Local trainings (More than 7 days) were not offered during the year 2021.

9. OVERSEAS VISITS

Overseas visits were not made during the year 2021.

10. OVERSEAS TRAININGS

1. Mrs. P.R. Weerasinghe/ Research Officer is reading for the Postgraduate studies in The University of Tokyo, Japan from 01.10.2021 to 31.03.2023.

2. Mrs. G.S. Nirukshan/ Research Officer is reading for the Spilt-type Postgraduate Degree (Ph.D) (Second Phase) in Ghent University, Belgium from 15.08.2021 to 14.02.2022.

11. TRANSPORT ACIVITIES

Vehicles of the Coconut Research Institute as at 31.12.2021.

Buses	03	Motor Bicycles	65
Lorries	02	Three Wheelers	03
Vans	05	Tractor	28
Cars	02	Tractor Trailer/Bowser	43
Cabs	16	Hand Tractors	08
Jeeps	01		

12. DEBTORS DUE TO VIOLATION OF BONDS

Name	Designation	Bond Value
Dr. K.B.Dasanayaka	Senior Research Officer	Rs. 2,039,715.00
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
Mrs. P.G.P.Hewawitharanage	Research Officer	Rs. 1,059,170.00
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

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STAFF ACHIEVEMENTS

Awards

1. Ms. B.H.R Fernando received the best research award in agriculture track in the 5th International Research Conference held during 1-2 July 2021 at Uva Wellassa University, Badulla, Sri Lanka.
2. M.K.F Nadheesha, A.J Mohotti and N Priyantha obtained best paper award for "Cadmium uptake by Coconut Palm and its sorption on soil in ionic medium" at the second International Plantation conference held in Malaysia on March 09th and 10th via online.
3. National Research Council Merit award for scientific research as evaluated by peers and published in the year 2018 for Boolean Calcium Signalling Model Predicts Calcium Role in Acceleration and Stability of Abscisic Acid-Mediated Stomatal Closure. Scientific Reports, 8(1).
4. National Research Council Merit award for scientific research as evaluated by peers and published in the year 2018 for Impact of extreme weather events on coconut productivity in three climatic zones of Sri Lanka. European Journal of Agronomy, 96, 47–53.
5. Merit award for the best undergraduate research 2020 - Miss. W.H.H Fernando for the research titled 'Optimizing Experimental Design in Coconut Research: Reduction of Experimental Error by Choosing Propper Data Analysis Techniques' supervised by Dr. Pramuditha Waidyarathne & Dr. D.D.M Jayasundara.

Postgraduate Studies Completed

1. Dr. A.A.A.J Atapattu completed PhD studies at CAS Key Laboratory of Tropical Forest Ecology, Xishuangbanna Tropical Botanical Garden attached to the University of Chinese Academy of Sciences.
2. Ms. P.R Weerasinghe received her M.Sc in Plant biology conservation and breeding from the Post Graduate Institute of Agriculture, University of Peradeniya.

Postgraduate Studies Undertaken

1. Mrs. S.S Udumann (Research Officer, Agronomy Division) continued the studies leading to MPhil degree, Postgraduate Institute of Agriculture, University of Peradeniya.
2. Ms. D.K.R.P.L Dissanayake, (Research Officer, Agronomy Division) continued the studies leading to MPhil degree, Postgraduate Institute of Agriculture, University of Peradeniya.
3. Ms. K.V.N.N Jayalath (Senior Research Officer, Agricultural Economics and Agribusiness Management Division) continued postgraduate studies leading to a PhD at the Postgraduate Institute of Agriculture, University of Peradeniya.
4. Ms. M.K.F Nadheesha (Senior Research Officer, Soils & Plant Nutrition Division) continued studies leading to PhD degree at the Postgraduate Institute of Science, University of Peradeniya.
5. Mrs. G.S Nirukshan (Research Officer, Soils & Plant Nutrition Division) continued studies leading to PhD degree in Applied Biological Sciences at Department of Soil Management, Doctoral School of (Bioscience) Engineering, and University of Ghent, Belgium.
6. Ms. D.M.P.D Dissanayake (Research Officer, Soils & Plant Nutrition Division) continued studies leading to PhD degree at the at Division of Environmental Sciences and Ecological Engineering, Korea University, Seoul, Korea.
7. Ms. B.H.R Fernando, Research Officer, Soils & Plant Nutrition Division continued studies leading to M.Sc. degree in Integrated Water Resources Management at Department of Agricultural Engineering, Postgraduate Institute of Agriculture, University of Peradeniya.
8. Mrs. N.I Suwandaratne (Research Officer, Crop Protection Division) continued the study leading to PhD degree at the University of Auckland, New Zealand.
9. Mr. P.H.P.R De Silva (Research Officer, Crop Protection Division) continued the post graduate studies for PhD at the University of Kelaniya.
10. Ms.T.H Chandrathilake (Research Officer, Plant Physiology Division) continued the postgraduate study leading to MSc. degree at the Postgraduate Institute of Agriculture, University of Peradeniya.
11. Mr. K.M.R.T Wijekoon (Technology Transfer Officer, Technology Transfer Division) continued the postgraduate studies leading to PhD at the University Putra Malaysia.
12. Ms. W.G.R Subhathma (Technology Transfer Officer, Technology Transfer Division) continued the postgraduate studies leading to MPhil at the Wayamba University until February 2021.
13. Ms. P.R Weerasinghe was awarded MEXT Japanese government scholarship to carry out her doctoral studies at the University of Tokyo, Japan.

Research Grants

1. A research grant of Rs. 2.325 million was received from the Council of Agricultural Research Policy under the Inter Institutional Multi disciplinary Research Grant Scheme (IIMDRGS) for the project on "Physico-chemical, sensory and nutritional characteristics of coconut flour incorporated foods".
2. A research grant of Rs. 3.02 million was received from the National Research Council of Sri Lanka for the project on "Coconut for the future: How will Coconut respond to global climate change".
3. Dr. D Kumarathunga was the Co-investigator of the research grant from the National Research Council Sri Lanka for the project on "Investigation of crop water usage and soil hydrological dynamics of oil palm (Elaeis guineensis Jacq.) and rubber (Hevea brasiliensis Muell. Arg.) plantations in the low country wet of Sri Lanka". The grant has been awarded to the Faculty of Agriculture, University of Peradeniya. The total budget of the grant is Rs. 5 Million.

Supervision of Undergraduate Students

1. Ms. H.P.D.T Hewa Pathirana supervised Ms. W.M.C.P Dissanayake, undergraduate student from Open University of Sri Lanka, research project "Improvement to coconut butter" in 2021.
2. Ms. H.P.D.T Hewapathirana supervised Mr. D.K Dodangoda, undergraduate student from Open University of Sri Lanka, research project on "Development of cheese spread from skim coconut milk by using lactic acid" in 2021.
3. Ms. H.P.D.T Hewapathirana and Dr. C Yalegama Supervised Mr.R.M.S.I Rathnayake, undergraduate student from Sabaragamuva University of Sri Lanka, project on "Development of a coconut skim milk beverage" in 2021.
4. Ms. H.P.D.T Hewapathirana and Dr. C Yalegama supervised Ms E.V.F Arachchi, undergraduate student from Sabaragamuva University of Sri Lanka, "Development of curry cube with coconut milk" in 2021.
5. Dr. Chandi Yalegama supervised Ms. Ashini Athukorala, undergraduate student from Eastern University of Sri Lanka, " Physico chemical evaluation of pectin extracted from tender king coconut kernel" in 2021.
6. Dr. Chandi Yalegama and Ms. H.P.D.T Hewapathirana supervised Ms. R.P.S.M Rajapaksa, Postgraduate student from Post Graduate Institute of Agriculture, research project "Compositional analysis and quality evaluation of coconut paring oil produced in North Western Province" in 2021.
7. Dr. Chandi Yalegama supervised Mr. A.W Premasiri, M.Phil. student of Sabaragamuwa University of Sri Lanka, " Indigenous techniques and practices of Traditional toddy industry in Sri Lanka, special preference to Coconut Toddy in 2021.
8. Dr. M.K Meegahakumbura supervised the undergraduate research student Ms. M.S.A.S.S Mirissage from the Faculty of Animal Science and Export Agriculture, Uva wellassa University, Sri Lanka.
9. Dr. M.K Meegahakumbura supervised the undergraduate research student Mr. K.T Nilupul of the Faculty of Technology, Wayamba University of Sri Lanka.
10. Dr. H.D.M.A.C Dissanayaka supervised the Industrial Training programme of Ms. Sachini Dilshani, Faculty of Technology, Rajarata University of Sri Lanka.

11. Ms. M.K.F Nadheesha supervised two industrial training students Ms. W.G. Arosha Prabodhi Fernando and Mr. K.M.C.P Nawarathna Bandara from Jaffna University.
12. Ms. M.K.F Nadheesha supervised the final year research student Ms. T.A.D.B.C. N Appuhamy, Eastern University of Sri Lanka. The title of the project was the "Determination of Nutrient content of Market available fertilizers for coconut".
13. Ms. M.K.F Nadheesha supervised the final year research student Ms. K.D.C Premarathne, Open University of Sri Lanka. The title of the project was the "Downward Movement Pattern of Exchangeable Ions and Nutrient Status of coconut Palms after long term application of Fertilizer Under Different Fertilizer Placement Techniques: A case study at Ranawana Estate, Kurunegala.
14. Dr. K.P Waidyarathne served as an external supervisor of Ms. K.M.T.L Fernando for a B.Sc. undergraduate project – Department of Statistics, University of Kelaniya, Sri Lanka in 2021.
15. Dr. K.P Waidyarathne served as a supervisor of Ms. K.M.T.L Fernando for six months industrial training on use of statistics in coconut research – Department of Statistics, University of Kelaniya, Sri Lanka in 2021.

Supervision of Diploma Students

1. Ms. M.K.F Nadheesha and Ms. B.H.R Fernando supervised the industrial training programme of Ms. D.R.S.S.K Madawala Higher National Diploma student at Sri Lanka School of Agriculture - Wariyapola for eight months period.

Thesis Evaluations

1. Dr. H.D.M.A.C. Dissanayaka served as a thesis examiner of the PhD thesis of Ms. W.I.B.P Abhayawickrama, Wayamba University of Sri Lanka.

Title : QTL map based candidate gene discovery for salt tolerance in rice (Oryza sativa).

2. Dr. H.D.M.A.C. Dissanayaka served as a thesis examiner of the PhD thesis of Ms. D.V.S. Kulathanthri of University of Sri Jayawardenapura, Sri Lanka.

Title : Molecular and morphological assesment of genetic diversity and drought stress related transcriptome screening of exsitu conserved sorghum (Sorghum bicolor (L.) Moench) accessions in Sri Lanka.

Internships

1. Ms. M.G.A.M Maswalagedara, student from Faulty of Technology, University of Jafna, underwent 4 months internship training at Coconut Processing Research Division in 2021.
2. Ms. N.R.H Chathurangi, student from Faculty of Technology, South Eastern University underwent 6 months internship training at Coconut Processing Research Division in 2021.
3. Ms. M.T.P Nilmini, student from Faculty of Technology, University of Jaffna of Sri Lanka underwent 6 months internship training at Coconut Processing Research Division in 2021.

Served as Referees

1. Dr. M.K Meegahakumbura and Dr. H.D.M.A.C Dissanayaka served as members of the Judging Panel of the Agriculture Research Symposium (AGRES), Wayamba University of Sri Lanka.
2. Dr. H.D.M.A.C Dissanayaka served as member of the Judging Panel of the YSF symposium 2021.
3. Dr. A.D Nainanayake served as a reviewer for the Journal of the Rubber Research Institute of Sri Lanka in 2021.

Served as Visiting Lecturers

1. Dr. M.K Meegahakumbura and Dr. H.D.M.A.C Dissanayaka conducted lectures at the Faculty of Technology, South Eastern University of Sri Lanka.
2. Dr. K.P Waidyarathne served as a visiting lecturer for the B.Sc under graduate course of "use of modern applications for commercial agriculture" in the department of plant sciences, university of Colombo.

Served as a Resource Person

1. Dr. A.A.A.J Atapattu, (2021) served as a resource person and delivered lectures on Potential of intercropping under coconut and Intercropping systems under Coconut at ICC - CRISL International Certificate Course for Coconut Development Officers, Coconut Research Institute. Virtual.
2. Mr. S.A.S.T Raveendra, (2021) served as a resource person and delivered lectures on Soil conservation and soil moisture conservation in coconut lands, Weed management in coconut lands and Livestock management in coconut lands for ICC - CRISL International Certificate Course at Coconut Development Officers, Coconut Research Institute. Virtual.

3. Mrs. D.K.R.P.L Dissanayake, (2021) served as a resource person and delivered a lecture on Soil conservation and soil moisture conservation in coconut lands at ICC - CRISL International Certificate Course for Coconut Development Officers, Coconut Research Institute. Virtual.
4. Dr. Chandi Yalegama contributed as a resource person to conduct technology transfer workshop on manufacturing and quality assurance of virgin coconut oil on 23rd Many 2021 at Technical services Division of Industrial Development Board.
5. Ms M.K.F Nadheesha and Ms. B.H.R Fernando served as resource person and delivered lectures in International Certificate Course on Coconut Plantation Management for Coconut Development Officers of ICC member countries, conducted by Coconut Research Institute.
6. Ms M.K.F Nadheesha, Ms. G. S Nirukshan and Ms. B.H.R Fernando served as a resource person in one day training programmes conducted by Coconut Research Institute.
7. Ms M.K.F Nadheesha, Ms. B.H.R Fernando served as a resource person and delivered lecture series to Coconut Development Officers in training programs conducted by Coconut Cultivation Board.
8. Ms. M.K.F Nadheesha and Ms. G. S Nirukshan served as a resource person at the Research Extension Dialogues jointly organized by Coconut Research Institute and Coconut Cultivation Board.
9. Dr. K.P Waidyarathne represented the Coconut Research Institute in the Monsoon Forums conducted by Department of Meteorology, Sri Lanka.
10. Dr. K.P Waidyarathne served as a resource person in curriculum revision workshop by the Department of Statistics & Computer Science, University of Kelaniya in 2021.
11. Dr. A.D Nainanayake served as the resource person for the third International Certificate Course on Coconut Plantation Management from 4th October to 5th November 2021 jointly organized by the CRISL and the International Coconut Community (ICC).
12. Dr. M.D.P Kumarathunga served as the resource person for the third International Certificate Course on Coconut Plantation Management from 4th October to 5th November 2021 jointly organized by the CRISL and the International Coconut Community (ICC).
13. Ms. T.H Chandrathilake served as the resource person for the third International Certificate Course on Coconut Plantation Management from 4th October to 5th November 2021 jointly organized by the CRISL and the International Coconut Community (ICC).

Presentations made by the Staff

1. Ms P.R Weerasinghe conducted an inhouse seminar on Molecular and morphological investigation of weak palms in Tall coconut Population.
2. Dr. H.D.M.A.C Dissanayaka conducted a webinar for the Plant Breeding students of the Open University of Sri Lanka on coconut breeding.
3. Ms. B.H.R Fernando made a presentation on "Establishment and Maintenance of Micro Irrigation Systems" at the workshop conducted for stakeholders of coconut sector jointly organized by Coconut Research Institute, Coconut Cultivation Board and Coconut Development Authority on 6th April 2021.
4. Ms. M.K.F Nadheesha made an oral presentation on "Insights into organic manure recommendation for coconut" held on 3rd August 2021 to Baurs Fertilizer Company Group at Coconut Research Institute.
5. Ms. M.K.F Nadheesha made a talk on "Readiness of organic cultivation for coconut" conducted by the coconut Research Institute for the Growers association held on 29h September via online.
6. Ms. M.K.F Nadheesha made an oral presentation on "Let us know about the organic fertilizer recommendation for coconut" held on 09th October 2021 Conducted by Coconut Research Institute to coconut growers via zoom.
7. Ms. M.K.F Nadheesha presented in an in-house seminar on "Insights of Soil Quality Enhancement with Biochar Incorporation into Coconut Growing Soils" at Coconut Research Institute held on 27th August 2021 via online.
8. Ms. M.K.F Nadheesha made an oral presentation on "Challengers and opportunities in the Coconut Sector at the Webinar- an Organic Sri Lanka: Challenges and Opportunities in the Plantation Sector" held on 03rd June 2021 conducted by National Institute of Plantation management.
9. Ms. G. S Nirukshan served as a guest speaker to talk about Public Sector Employment Opportunities in Soil Science in the Webinar "Boost your career prospects while at university" organized by the Soil Science Society Faculty of Agriculture" for Soil Science majoring undergraduate students of Faculty of Agriculture, University of Peradeniya on 9th May 2021.

Served in Committees / Meetings / Workshops

1. Dr. A.A.A.J Atapattu served as a Consultant (Coconut sector): Agroforestry Mainstreaming in Tea and Coconut in Sri Lanka (2021-2022) by the Netherlands Enterprise Agency (RVO) and International Union for Conservation of Nature (IUCN).
2. Dr. A.A.A.J Atapattu served as a Member: Fertilizer Advisory Committee (2021-2022), National Fertilizer Secretariat (NFS), Ministry of Agriculture.

3. Dr. A.A.A.J Atapattu, served as a Member: Board of Study (2021-2022), Advanced Certificate Course in Organic Agriculture and Plantation Management, National Institute of Plantations Management (NIPM).
4. Dr. A.A.A.J Atapattu, served as a Member: Inter- Institutional Committee on Establishment of University of Plantation Research and Management (UPRM).
5. Dr. A.A.A.J Atapattu, served as a Member: Organic Fertilizer Steering Committee, Ministry of Plantation Industries.
6. Dr. Chandi Yalegama served as a member in working group of Sri Lanka Standard Institute on drafting standards for treacle (DSLS 722) and jaggary (DSLS521) in 2021.
7. Ms. J.A.K.M Fernando served as a member of committee on Agricultural Mechanization of SL/CARP in 2021.
8. Dr. Chandi Yalegama served as a member of the Board of Study: Professional programs in Coconut Processing (Technology and practices) of National Institute of Plantation Management in 2021.
9. The staff Served in Technical Evaluation Committees for purchasing capital and consumable items and board of surveys and media related comittees in CRI.
10. Dr. Chandi Yalegama served as a member of judging panel at the annual symposium organized by Faculty of Livestock, fisheries and nutrition of Wayamba University of Sri Lanka on 10th December, 2021.
11. Dr. Chandi Yalegama contributed as a resource person in workshop for coconut oil producers on quality standards of raw material.
12. Dr. Chandi Yalegama participated in an online worshop conducted by International coconut community secretariate in Jakartha on quality standards for coconut products as a resource speaker on Sri Lankan National standards for different coconut products on 13-14 July, 2021.
13. Dr. Chandi Yalegama participated in a Webinar organized by International coconut community secretariate in Jakartha on 30th November, 2021 as a resource person to conduct a presentation on Processing Production and Marketing of coconut milk, cream and yoghurt.
14. Dr. Chandi Yalegama participated in an online panel discussion on Processing Production and Marketing of coconut milk, cream and yoghurt, organized by the International Coconut Community Secretariate in Jakartha on 14th December, 2021.
15. Dr. H.D.M.A.C Dissanayaka served as the Course Coordinator of the ICC-CRISL International Training Programme for coconut development officers.
16. Dr. M.K Meegahakumbura served as a Stakeholder member, Bachelor of Engineering Technology (Hons.) in Material and Nano Science Technology

Degree Programme, Department of Nano Science and Technology, Wayamba University of Sri Lanka.

17. Dr. M.K Meegahakumbura served as a member of the Estate Committee of the Coconut Research Institute, Sri Lanka.
18. Dr. M.K Meegahakumbura served as an elected member of the EPF Committee of the Coconut Research Institute, Sri Lanka.
19. Ms. B.H.R Fernando contributed as an author of the Training Manual for the International Certificate Course on Coconut Plantation Management for Coconut Development Officers of ICC member countries organized by the Coconut Research Institute and the APCC.
20. Ms M.K.F Nadheesha served as one of the panelists of the discussion on "Way forward to sustain agricultural production with organic fertilizers" held on 17th May 2021 conducted by Soil Science Society of Sri Lanka.
21. Ms M.K.F Nadheesha served as one of the panelists of the discussion on "Webinar- An Organic Sri Lanka: Challenges and Opportunities in the Plantation Sector" held on 03rd June 2021 conducted by National Institute of Plantation management.
22. Dr. A.D Nainanayake 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 2021.
23. Dr. A.D Nainanayake served as the chairman of the Estate Committee of the Coconut Research Institute.
24. Dr. A.D Nainanayake served as the Course Director of the International certificate course for coconut development officers – 2021 conducted by International coconut Community and Coconut Research Institute of Sri Lanka, from 4th October – 5th November 2021.

Local training programme /workshop attended

1. Ms. B.H.R Fernando attended to a workshop (online) on "Data Analysis using SAS" conducted by Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka on 17th and 18th September 2021.
2. Ms M.K.F Nadheesha, Ms. G.S Nirukshan and Ms. B.H.R Fernando participated in online webinar series on organic cultivation conducted by numerous institutes.
3. Ms. G.S Nirukshan and Ms. B.H.R Fernando participated in a webinar conducted by "Way forward to sustain agricultural production with organic fertilizers" organized by the Soil Science Society of Sri Lanka for its members on 17th May 2021.

4. Ms. G.S Nirukshan and Ms. B.H.R Fernando participated in a webinar conducted by National Institute of Planation Management titled "An Organic Sri Lanka: Challengers and Opportunities in the Plantation Sector" on 3rd June 2021.
5. The Research and technical and laboratory and field assistants of the division staff were given one day training by invited resource person at the Incubation centre of Coconut Processing Research Division on 24th November 2021.
6. Ms. Dilani Hewa Pathirana, Ms. Kumudu Fernando and Ms. Meththa Lakusinghe participated in online training workshop on HACCP/ ISO 22000 standards and implementation of food safety managements system (FSMS) conducted by Sri lanka Standard Institute on 7th January 2021.

International training programme /workshop attended

1. Ms. G.S Nirukshan attended a presentation of Soil and Water Sciences Department, University of Florida's Seminar series on 'Soil Boron Determination in Coastal Plant of Florida' on the 9th July 2021.
2. Ms. G.S Nirukshan followed three seminars under the specialist courses RE-Source.bio Seminar, which was held via virtual platforms by the Faculty of Bio Science Engineering, University of Gent during the period of January 2021 – July 2021.
3. Ms. G.S Nirukshan participated in a Webinar organized by Initernational Biochar Initiatives (IBI) on "What is 'the best' biochar?" on 14th July 2021 via virtual platform.
4. Ms. Dilani Hewa Pathirana and Dr. chandi Yalegama Participated in 3 day advance training workshop on implementation and HACCP and quality system for food industry by Food safety and quality Solutions, Canada on 21st, 23rd September and 16th November, 2021.

Science Citation Indexed Journals

1. Anthony, M., Sabri, M. F., **Wijekoon, R.**, Rahim, H. A., Abdullah, H., Othman, M. A., & Irwan Syah Md. Yusoff, I. S. M. (2021). The influence of financial socialization, financial behavior, locus of control, and financial stress on young adults' financial vulnerability. *International Journal of Academic Research in Business and Social Sciences*, 11(19), 289–309, http://dx.doi.org/10.6007/IJARBSS/v11-i19/11738.

2. **Herath, C. S., & Wijekoon, R.** (2021). Growers' fertilizer application behavior and their willingness to pay for the fertilizer: A study in coconut triangle of Sri Lanka. *Thai Journal of Agricultural Science*, 54(1), 47-63.

3. Khan, M.U., Lee, J.T.E., Bashir, M.A, **Dissanayake, P.D.**, Ok, Y.S., Tong, Y.W., Shariati, M.A., Wu, S., Ahring, B. K. (2021). Current status of biogas upgrading for direct biomethane use: A review. *Renewable and Sustainable Energy Reviews*, 149, 111343 https://doi.org/10.1016/j.rser.2021.111343.

4. Kim S Ely, Alistair Rogers, Deborah A Agarwal, Elizabeth A Ainsworth, Loren P Albert, Ashehad Ali, Jeremiah Anderson, Michael J Aspinwall, Chandra Bellasio, Carl Bernacchi, Steve Bonnage, Thomas N Buckley, James Bunce, Angela C Burnett, Florian A Busch, Amanda Cavanagh, Lucas A Cernusak, Robert Crystal-Ornelas, Joan Damerow, Kenneth J Davidson, Martin G De Kauwe, Michael C Dietze, Tomas F Domingues, Mirindi Eric Dusenge, David S Ellsworth, John R Evans, Paul PG Gauthier, Bruno O Gimenez, Elizabeth P Gordon, Christopher M Gough, Aud H Halbritter, David T Hanson, Mary Heskel, J Aaron Hogan, Jason R Hupp, Kolby Jardine, Jens Kattge, Trevor Keenan, Johannes Kromdijk, **Dushan P Kumarathunge**, Julien Lamour, Andrew DB Leakey, David S LeBauer, Qianyu Li, Marjorie R Lundgren, Nate McDowell, Katherine Meacham-Hensold, Belinda E Medlyn, David JP Moore, Robinson Negrón-Juárez, Ülo Niinemets, Colin P Osborne, Alexandria L Pivovaroff, Hendrik Poorter, Sasha C Reed, Youngryel Ryu, Alvaro Sanz-Saez, Stephanie C Schmiege, Shawn P Serbin, Thomas D Sharkey, Martijn Slot, Nicholas G Smith, Balasaheb V Sonawane, Paul F South, Daisy C Souza, Joseph Ronald Stinziano, Ellen Stuart-Haëntjens, Samuel H Taylor, Mauricio D Tejera, Johan Uddling, Vigdis Vandvik, Charuleka Varadharajan, Anthony P Walker, Berkley J Walker, Jeffrey M Warren, Danielle A Way, Brett T Wolfe, Jin Wu, Stan D Wullschleger, Chonggang Xu, Zhengbing Yan, Dedi Yang. (2021). A reporting format for leaf-level gas exchange data and metadata.

Ecological Informatics, 61, 101232, https://doi.org/10.1016/j.ecoinf.2021.101232.

5. Kumar, A.N., **Dissanayake, P.D.**, Masek, O., Priya, A., Lin, C. S.K., Ok, Y.S., Kim, S-H. (2021). Recent Trends in Biochar Integration with Anaerobic Fermentation: Win-Win Strategies in a Closed Loop. *Renewable and Sustainable Energy Reviews*,149, 111371 https://doi.org/10.1016/j.rser.2021.111371.

6. Lee, J.T.E., Ok, Y.S., Song, S., **Dissanayake, P.D.**, Tian, H., Tio, Z. K., Cui, R., Lim, E. Y., Jong, M-C. Hoy, S.H., Lum, T.Q.H., Tsui, T.H., Yoon, C.S., Dai, Y., Wang, C.H., Tan, H.T.W., Tong, Y.W. (2021). Biochar utilisation in the anaerobic digestion of food waste for the creation of a circular economy via biogas upgrading and digestate treatment. *Bioresource Technology*, 333,125190 https://doi.org/10.1016/j.biortech.2021.125190.

7. Maged, A., **Dissanayake, P.D.**, Yang, X., Pathirannahalage, C., Bhatnagar, A., Ok, Y.S. (2021). New mechanistic insight into rapid adsorption of pharmaceuticals from water utilizing activated biochar. *Environmental Research*, 202, 111693 https://doi.org/10.1016/j.envres.2021.111693.

8. Poh, L. M., Sabri, M. F., Rahim, H. A., & **Wijekoon, R.** (2021). Determinants of financial vulnerability among civil servants in peninsular Malaysia. *Malaysian Journal of Consumer and Family Economics*, 27, 113-143.

9. Sabri, M. F., Anthony, M., **Wijekoon, R.**, Suhaimi, S. S. A., Rahim, H. A., Magli, A. S., & Isa, M. P. M. (2021). The Influence of financial knowledge, financial socialization, financial behavior, and financial strain on young adults' financial well-being. *International Journal of Academic Research in Business and Social Sciences*, 11(12), 566-586, http://dx.doi.org/10.6007/IJARBSS/v11-i12/11799.

10. Sabri, M. F., Dass, T. M., Burhan, N. A. S., Rahim, H. A., **Wijekoon, R.**, & Simanjuntak, M. (2021). Determinants of life satisfaction among female-headed households in Malaysia. *International Journal of Business and Society*, 22(1), 276-295. https://doi.org/10.33736/ijbs.3175.2021.

11. Samarasinghe, C.R.K., **Meegahakumbura M.K.**, **Kumarathunge D.P.**, **Dissanayaka H.D.M.A.C.**, **Weerasinghe P.R.**, Perera L. (2021). Genotypic selection approach made successful advancement in developing drought tolerance in perennial tree crop coconut. *Scientia Horticulturae*, 287, 110220. https://doi.org/10.1016/j.scienta.2021.110220.

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3. **Nirukshan, G.S., Fernando, B.H.R., Ranasinghe, C.S.,** and Sleutel S. (2021). Manipulation of Beneficial Microorganisms in the Coconut Rhizosphere: A Sustainable Soil Fertility Management Approach. In: Probir Kumar Ghosh (Ed). Cocos nucifera: Production, Cultivation and Uses. *Nova Science*, New York, USA. Pp. 49-73

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PAL/F/CRB/01/2021/44 01 September 2022

The Chairman
Coconut Research Board

Report of the Auditor General on the Financial Statements and Other Legal and Regulatory Requirements of the Coconut Research Board for the year ended 31 December 2021 in terms of Section 12 of the National Audit Act, No. 19 of 2018.

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1 . Financial Statements

1.1 Qualified Opinion

The audit of the financial statements of the Coconut Research Board for the year ended 31 December 2021 comprising the statement of financial position as at 31 December 2021 and the statement of financial performance, statement of changes in equity /net assets and the cash flow statement for the year then ended, and the notes in relation with the financial statements, including a summary of significant accounting policies was carried out under my direction in pursuance of provisions in Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with provisions of the National Audit Act No. 19 of 2018 and Finance Act No. 38 of 1971 . My report to Parliament in pursuance of provisions in Article 154 (6) of the Constitution will be tabled in due course.

In my opinion, except for the effects of the matters described in the basis for Qualified Opinion section of my report, the accompanying financial statements give a true and fair view of the financial position of the Board as at 31 December 2021 and of its financial performance and its cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards .

1.2 Basis for Qualified Opinion

(a) As a result of the prior year adjustments, scientific assets and current assets and liability items were adjusted in an inaccurate manner in computation net cash flow under operational activities, the net cash flow that had indicated under operational activities had been overstated by Rs. 102,986,393. As a result of adjustments made for the assets indicated under financial activities were not accurately done, the net cash flow under financial activities had been understated by Rs. 154,071,712 .

(b) Although the effect and value of an event that can be expected to affect in future periods should be disclosed in the financial in accordance with Paragraph 44 of Sri Lanka Public Sector Accounting Standards No. 03 and also complaints had been made to the Fraud Investigation Bureau in connection with the failure of paying the amount of Rs.6,334,159 stated in the financial statements to be collected from a buyer for the coconuts sold in the year under review, a disclosure had not been made in the financial statements in this regard.

(c) Actions had not been taken to amortize the assets purchased from project grants received by the institution as stated in Paragraphs 44 and 45 of Sri Lanka Public Sector Accounting Standards No. 11. As a result , it was observed that the value of the grants of Rs.130,657,057 stated in the financial statements was not accurately represented in the financial statements.

(d) Scientific or technological knowledge, advertising devices and videos etc. should be identified as intangible assets in accordance with Paragraph 17 of Sri Lanka Public Sector Accounting Standards No. 20 and the depreciation should be done over the useful life. Nevertheless, a sum of Rs. 5,775,000 incurred for video programmes related to the use of coconut advertised on television, radio and social media with the aim of promoting long-term local and foreign technology had been written off as research expenses in the year under review. Due to this, the surplus and intangible assets of the year under review were understated in the financial statements by that amount.

(e) Although the cost incurred by the Board for improving the infrastructure of the estates was shown in the financial statements under non-current assets, the details of adjustments of Rs.13,229,854 made for those assets in the year under review were not submitted to the audit. As a result, the accuracy of these assets could not be confirmed in the audit.

(f) The invoices had not been issued for 762,522 coconuts auctioned for value in 51 auctions held between 13 May to 23 December 2021. As a result, the stock in the financial statements of the year under review had been overstated and the sales income and debtors were understated by Rs. 45,788,857 each in the financial statements.

I conducted my audit in accordance with Sri Lanka Auditing Standards (SLAuSs) . My responsibilities, under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of my report. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my qualified opinion.

1.3 Other Information Included in the Annual Report 2021 of the Coconut Research Board

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The other information comprises the information included in the Annual Report 2021 of the Coconut Research Board, but does not include the financial statements and my auditor's report thereon, which I have obtained prior to the date of this auditor's report. The Management is responsible for these other information.

My opinion on the financial statements does not cover the other information and I do not express any form of assurance conclusion thereon.

In connection with my audit of the financial statements, my responsibility is to review the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on other information obtained by me and work performed by me prior to the date of this auditor's report, I conclude that this other information is materially misstated, I need to report that fact. I have nothing to report in this regard.

1.4 Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation of financial statements that give a true and fair view in accordance with Sri Lanka Public Sector Accounting Standards, and for such internal control as Management determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, Management is responsible for assessing the Coconut Research Board's ability to continue as a going concern and it is also the responsibility of Management to keep accounts on a going concern basis and to disclose matters related to the going concern of the Board except for the Management intends to liquidate the Coconut Research Board or cease operations in the absence of any other alternative.

Those charged with governance are responsible for overseeing the Board's financial reporting process.

As per Section 16 (1) of the National Audit Act No. 19 of 2018, it is required to maintain proper books and records of all its income, expenditure, assets and liabilities, to enable annual and periodic financial statements to be prepared of the Coconut Research Board.

1.5 Auditor's Responsibilities for the Audit of the Financial Statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Sri Lanka

Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Sri Lanka Auditing Standards, I exercise professional judgment and maintain professional scepticism throughout the audit. I furthermore,

- Identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Though an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances was obtained, it was not for the purpose of expressing an opinion on the effectiveness of the internal control.

- Evaluated the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Management.

- Concluded on the appropriateness of the Management's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Coconut Research Board's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. However, future events or conditions may cause to cease to continue as a going concern.

- Evaluated the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with those charged with governance regarding, among other matters, significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

2. Report on Other Legal and Regulatory Requirements

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2. 1 Special provisions for following requirements are included in the National Audit Act, No. 19 of 2018 .

2.1.1 I have obtained all the information and explanation that required for the audit and as far as appears from my examination except for the impact of the matters described in the section on the Basis for the Qualified Opinion in my report and proper accounting records had been kept by the Board as per the requirement of Section 12 (a) of the National Audit Act, No. 19 of 2018.

2.1.2 The financial statements presented by the Board is consistent with the preceding year as per the requirement of Section 6 (1) (d) (iii) of the National Audit Act, No. 19 of 2018 .

2.1.3 The financial statements presented includes all the recommendations made by me in the previous year as per the requirement of Section 6 (I) (d) (iv) of the National Audit Act, No. 19 of 2018, except for the observations in Paragraphs 1.2 (c) of this report.

2.2 Based on the procedures performed and evidence obtained were limited to matters that are material, nothing has come to my attention to make declaration on following;

2.2.1 To state that any member of the governing body of the Board has any direct or indirect interest in any contract entered into by the Board which are out of the normal cause of

business as per the requirement of Section 12 (d) of the National Audit Act, No. 19 of 2018 .

2.2.2 To state that the Board has not complied with any applicable written law, general and special directions issued by the Governing Body of the Board as per the requirement of Section 12 (f) of the National Audit Act, No. 19 of 2018 except for the observations appear below;

Reference to Laws , Rules Directives	Observation
Financial Regulation of Democratic Socialist Republic of Sri Lanka F.R. 143 (3) (a)	Although all the money receive should be regularly deposited in the bank, a sum of Rs. 12,052,646 collected in the year 2021 in the Pallama Plant Genetic Resources Centre had been deposited with a delay in between 07 days and 42 days.

2.2.3 To state that it had not performed according to Board's powers, functions and duties as per the requirement of Section 12 (g) of the National Audit Act, No. 19 of 2018 .

2.2.4 To state that the resources of the Board had not procured and utilized economically, efficiently and effectively within the time frames and in compliance with the applicable laws as per the requirement of Section 12 (h) of the National Audit Act, No. 19 of 2018 except for the observations mentioned below.

(a) Although 02 water supply systems had been established at a cost of Rs.26,425,215 to provide water to 4015 coconut trees in the area of 75 acres of Ambakele Genetic Resource Centre and 8000 coconut saplings in the area of 200 acres of Pallama Genetic Resource Centre, enough water to a tree had not received due to lack of sufficient water in 04 tube wells built for that purpose and by collecting water in 04

tanks and a well and dividing the area and supplying water once in 07 days and the 215-acre coconut plantation at Pallama Genetic Resource Centre was not covered by this water supply system. As a result, it was not observed that the desired outcomes were obtained from these water systems.

(b) A number of 72,623 coconuts which were auctioned to a private company in Colombo on 04 occasions in the months of May, June and July 2021 valued at Rs. 4,484,947 but were not paid and taken away and resold them for Rs.3,011,053 after sprouting by holding them for 06 to 09 months till 10 February 2022, a loss of Rs.1,473,894 had been incurred by the Board.

(c) Seven cheques of Rs. 6,334,159 obtained for 96,816 coconuts sold by the Board to 02 companies in May and June 2021 had been returned and it had been allowed to remove the coconut stocks before the cheques were realized. Out of that, despite of the cheques of the Company which was sold 86,816 coconuts for Rs.5,627,159 continued being returned, without considering that, another 218,335 coconuts valued at Rs. 12,659,704 were given to that Company and the invoice had not been issued even by the end of the year and actions had not been taken to account for and recover delay charges and fines for a sum of Rs. 45,788,857 receivable for 762,522 coconuts sold in 51 auctions including these stocks of coconuts as per Coconut Auction Rules of the Coconut Development Authority. It was not observed that the proper attention of the management was drawn on these controversial transactions.

(d) Although the coconuts should be sold as soon as they are plucked in terms of Estate Management Circular No. 02/2019 dated 7 July 2019 of the Board, actions had not been taken even by 31 December 2021 to sell a number of 939,933 nuts which was 22 per cent out of 4,123,986 coconuts plucked from January to November 2021 at 10 Genetic Resource Centres.

2.3 Other Matters

(a) Although circulars have been issued regarding the harvesting of coconuts in the coconut plantations owned by the Board, adequate instructions had not been given on how to reduce the percentage of falling coconuts, the number of coconuts to be plucked annually, how to deal with unripe coconuts, rotten coconuts and spoiled coconuts. Therefore, it could not observe that the coconut harvest of the Board has been beneficially and successfully managed.

(b) When receiving 12-shift coconut harvest at Potthukulama Centre out of the 10 Genetic Resource Centres belonging to the Board during the year 2021, the harvest obtained in other 09 centres was only 07 or 08 shifts. However, failure to pluck coconuts on time affects the optimum coconut yield, the attention of the responsible parties had not been drawn on it.

(c) Legal actions had been taken to recover an amount of Rs.27,529,683 which was receivable to the Board from the officers and guarantors as per the agreement for 08 officers who had received scholarships abroad and did not return to work between the years 1992-2014.

(d) It was a controversial matter that the Ambakele Genetic Resource Centre owned by the Board had 21 cows but had not reported any milk sales income after 16 March 2018. Further, It was observed that the administrative works are not being done properly due to the fact that the field and administrative works of this 318.5 acre centre are done by an Assistant Estate Superintendent and all the office works are done by a check roll based worker,

(e) As per the Guidelines for Nursery Control and selection of coconut plants mentioned in the Instruction Paper No. 02 of the Coconut Research Institute, the non-sprouting nuts within 05 months and late-sprouting nuts should be removed of planting and it had been stated that the percentage was 18 per cent. Nevertheless, the number of plants that were unsuccessfully removed in 5 months from 99,670 hybrid seeds of several varieties

planted in 2020 Yala Season and 2021 Maha Season at Pallama and Ambakele Genetic Resource Canters was 28098 which was as high as 28 per cent and the attention of the responsible parties had not drawn on this.

(f) A number of 115 posts out of the 391 approved staff were in vacant as per the staff information of the institution as at 31 December 2021 and it was 29 per cent out of the approved number of employees. Similarly, 21 out of 56 approved research officers, including Head of Department, Senior Research Officer of 9 Research Divisions of the Board, were in vacant and it was 37per cent out of the approved number. It is observed that this situation affects the failure of fulfilling the purpose of establishing the institution properly.

(g) The Board did not specify a year in which 08 long-term researches commenced between the years 2015 and 2021 will be completed and another 08 research projects were being carried out for a period of 9 to 21 years. Similarly, another 21 researches commenced between 2016 and 2019 that were planned to be completed in 2021 had not been completed. As a result, it was observed that the officer who had commenced the research did not get the chance to finish it, the change in technology over time, etc., affected the results of the research, and applied it for the purposes of the Board.

W.P.C. Wickramarathne

Auditor General

Significant Accounting Policies

1. 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.

i. The total Recurrent grant received from the Treasury for the year is recognized as income and the for that year.

ii. 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.

iii. 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.

COCONUT RESEARCH INSTITUTE

STATEMENT OF FINANCIAL PERFORMANCE

FOR THE YEAR ENDED 31ST DECEMBER 2021

	NOTES	2021 APPROVED BUDGET Rs.	2021 ACTUAL Rs.	2020 ACTUAL Rs.
OPERATING REVENUE				
TRANSFERS FROM TREASURY & OTHER ENTITIES	03	287,000,000	264,300,000	257,500,000
GENETIC & RESEARCH CENTER REVENUE	04	271,504,483	315,110,842	281,482,871
OTHER REVENUE	05	-	71,372,769	68,373,169
TOTAL REVENUE		**558,504,483**	**650,783,610**	**607,356,040**
OPERATING EXPENCES				
WAGES SALARIES AND EMPLOYEES' BENEFITS	06	210,330,000	211,279,603	214,399,742
SUPPLIES & CONSUMABLES USED	07	64,245,000	52,563,469	61,074,571
DEPRECIATION & AMORTISATION EXPENCES	10		21,809,454	22,489,324
GENETIC & RESEARCH CENTER EXPENSES	04	230,766,483	154,379,730	223,835,622
RESEARCH & DEVELOPMENT EXPENCES WRITE OFF	08	-	35,428,382	36,788,703
OTHER EXPENSES	09	12,425,000	24,077,180	29,128,457
TOTAL EXPENSES		**517,766,483**	**499,537,818**	**587,716,418**
SURPLUS /(DEFICET) FOR THE PERIOD		**40,738,000**	**151,245,792**	**19,639,622**
OTHER COMPREHENSIVE INCOME/EXP:				
ACTURIAL GAIN/LOSS			633,485	22,535,623
NET SURPLUS /(DEFICET) FOR THE PERIOD			**151,879,277**	**42,175,245**

The Accounting Policies on pages 07 to 15 and Notes on pages 16 to 33 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.

CHAIRMAN
COCONUT RESEARCH BOARD

DIRECTOR
COCONUT RESEARCH INSTITUTE

SENIOR ACCOUNTANT
COCONUT RESEARCH INSTITUTE

Dr. Saranga Alahapperuma
Chairman
Coconut Research Board

Dr. (Mrs.) Sanathanie Ranasinghe
Director
Coconut Research Institute

R.M.U. Chandranath
MBA,Bsc (Mgt.) Sp.CPFA, CIPFA,
Senior Accountant
Coconut Research Institute
Lunuwila

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අධ්‍යක්ෂ (සංවර්ධන)
DIRECTOR
COCONUT RESEARCH BOARD

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COCONUT RESEARCH INSTITUTE

STATEMENT OF FINANCIAL POSITION

AS AT 31 ST DECEMBER 2021

	NOTES	2021 APPROVED BUDGET Rs.	2021 ACTUAL Rs.	2020 ACTUAL Rs.
NON CURRENT ASSETS				
INFRASTRUCTURE PLANT & EQUIPMENT	10	32,738,000	2,293,596,535	2,156,036,948
INTANGIBLE ASSETS	11		2,524,585	1,312,596
BIOLOGICAL ASSETS	12		34,970,430	31,869,680
OTHER NON FINANCIAL ASSETS	13		4,080,520	3,159,059
OTHER NON CURRENT ASSETS	14		87,169,324	81,090,442
		32,738,000	**2,422,341,394**	**2,273,468,724**
CURRENT ASSETS				
CASH & CASH EQUIVALANTS	15		245,986,804	125,396,992
RECIEVABLES	16		30,058,419	31,033,194
INVENTORIES	17		145,281,786	86,993,175
PREPAYMENTS	18		380,434	490,529
OTHER CURRENT ASSETS	19		35,944,658	20,950,219
		-	**457,652,100**	**264,864,109**
TOTAL ASSETS		**32,738,000**	**2,879,993,494**	**2,538,332,834**
LIABILITIES				
CURRENT LIABILITIES				
PAYABLES	20		66,611,564	60,208,877
EMPLOYEE BENEFITS	22		174,274,175	166,538,058
		-	**240,885,739**	**226,746,935**
NON CURRENT LIABILITIES				
CAPITAL CONTRIBUTED BY DONOR FUNDED PROJECTS & PAYABLES	21		130,657,057	173,256,556
		-	**130,657,057**	**173,256,556**
TOTAL LIABILITIES		-	**371,542,796**	**400,003,491**
NET ASSETS		**32,738,000**	**2,508,450,697**	**2,138,329,342**
NET ASSETS/EQUITY				
CAPITAL CONTRIBUTED BY THE OTHER GOVERNMENT ENTITIES		32,738,000	387,058,114	377,665,499
RESERVES			1,796,064,667	1,689,612,303
ACCUMULATED SURPLUS/(DEFECIT)			325,327,917	71,051,540
		32,738,000	**2,508,450,697**	**2,138,329,342**
TOTAL NET ASSETS/EQUITY		**32,738,000**	**2,508,450,697**	**2,138,329,342**

The Accounting Policies on pages 07 to 15 and Notes on pages 16 to 33 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.

CHAIRMAN	DIRECTOR	SENIOR ACCOUNTANT
COCONUT RESEARCH BOARD	COCONUT RESEARCH INSTITUTE	COCONUT RESEARCH INSTITUTE

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අධ්‍යක්ෂ (සංවර්ධන)
DIRECTOR
COCONUT RESEARCH BOARD
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COCONUT RESEARCH INSTITUTE

CASH FLOW STATEMENT

FOR THE YEAR ENDED 31ST DECEMBER

	2021 Rs.	2020 Rs.
CASH FLOW FROM OPERATING ACTIVITIES		
SURPLUS/(DEFICIT)	**151,879,277**	**42,175,245**
NON-CASH MOVEMENTS		
DEPRECIATION & AMORTIZATION	49,275,538	49,947,015
FIXED DEPOSIT INTEREST	(6,177,000)	(6,177,000)
INCREASE/(DECREASE) IN PAYABLES	7,477,688	(27,642,269)
INCREASE IN PROVISIONS RELATING TO EMPLOYEE COSTS	20,878,469	
EMPLOYEE GRATUITY PAYMENT	(13,142,352)	9,257,971
(GAINS)/LOSSES ON SALE OF PROPERTY, PLANT & EQUIPEMENT	4,130,000	4,186,945
INCREASE IN OTHER CURRENT ASSETS	(15,616,534)	6,309,374
DECREASE IN BIOLOGICAL ASSETS	(3,100,750)	(24,202,613)
DECREASE IN INVENTORIES	(58,288,610)	38,693,855
DECREASE IN RECEIVABLES	974,774	4,418,695
DECREASE IN PREPAYMENTS	110,096	(490,529)
PRIOR YEAR PROFIT ADJUSTMENT	101,504,238	11,816,274
NET CASH FLOW FROM OPERATING ACTIVITIES	**239,904,834**	**108,292,961**
CASH FLOW FROM INVESTING ACTIVITIES		
PURCHASE OF PLANT & EQUIPEMENT TREASURY FUND	(84,443,870)	(23,692,185)
PURCHASE OF INTANGIBLE ASSETS	(1,280,880)	(1,377,809)
PURCHASE OF LIBRARY BOOKS & PERIODICALS	(28,600)	-
ISSUED LOANS	(7,783,776)	(8,787,255)
SETTLEMENTS OF LOANS	8,503,989	7,813,710
NET CASH FLOW FROM INVESTING ACTIVITES	**(85,033,137)**	**(26,043,539)**
CASH FLOW FROM THE FINANCING ACTIVITIES		
TREASURY CAPITAL GRANT	70,000,000	70,000,000
DONOR FUNDED PROJECTS CAPITAL GRANT	130,986,493	12,495,858
RESEARCH & DEVELOPMENT AND ASSETS WRITE OFF	(235,268,378)	(64,072,156)
NET CASH FLOWS FROM THE FINANCING ACTIVITES	**(34,281,885)**	**18,423,702**
NET INCREASE / (DECREASE) IN CASH & CASH EQUIVALENTS	**120,589,812**	**100,673,123**
CASH & CASH EQUIVALENTS AT BEGINNING OF PERIOD	**125,396,992**	**24,723,869**
CASH & CASH EQUIVALENTS AT END OF PERIOD	**245,986,804**	**125,396,992**
BANK OF CEYLON - DANKOTUWA - A/C NO 3002507	6,137,899	6,343,859
BANK OF CEYLON - DANKOTUWA - A/C NO 3002942	66,438,803	22,924,800
BANK OF CEYLON - DANKOTUWA - A/C NO 3002556	7,131,458	24,463,048
BANK OF CEYLON - DANKOTUWA - A/C NO 3003088	155,575,445	61,992,056
BANK OF CEYLON - DANKOTUWA - A/C NO 3001528	2,339,434	1,195,204
BANK OF CEYLON - DANKOTUWA - A/C NO 75852571	7,801,298	7,995,059
BANK OF CEYLON - DANKOTUWA - A/C NO 84044222	557,467	477,967
	245,981,804	**125,391,992**
NSB - NEGOMBO		
BOC - NEGOMBO	5,000	5,000
CASH IN TRANSIT		-
	245,986,804	**125,396,992**

COCONUT RESEARCH INSTITUTE

STATEMENT OF CHANGES IN EQUITY/NET ASSETS

AS AT 31 ST DECEMBER 2021

NOTE	CONTRIBUTED BY THE GOVERNMENT	REVALUATION/ CAPITAL RESERVES	ACCUMULATED SURPLUS/DEFICIT	TOTAL EQUITY
BALANCE AS AT 01-01-2021	377,665,499	1,689,612,303	71,051,541	2,138,329,343
CAPITAL GRANT-TREASURY	70,000,000			70,000,000
SURPLUS/DEFICIT FOR THE YEAR			151,879,277	151,879,277
ASSETS WRITE OFF FOR THE CURRENT YEAR	(26,071,864)			(26,071,864)
R & D WRITE OFF FOR THE CURRENT YEAR	(35,428,382)			(35,428,382)
LIBRARY BOOKS ADJUSTMENT	892,861		-	892,861
VEHICLE REVALUATION GAIN		106,452,364		106,452,364
PRIOR YEAR PROFIT ADJUSTMENTS (Note 23)			102,397,099	102,397,099
BALANCE AS AT 12-31-2021	**387,058,114**	**1,796,064,667**	**325,327,917**	**2,508,450,697**

Figures in brackets indicate deductions

The Accounting Policies and Notes as Set out on the pages 7 to 33 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 2021	BUDGET 2021	TOTAL 2020
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
REVENUE															
Sales of Coconut	39,487,046	19,269,060	71,184,004	22,973,874	5,924,891	1,708,414	5,391,495	16,356,344	36,380,107	25,866,607	-	-	244,541,840	184,230,675	212,646,612
Sales of Copra	2,761,527	175,295			121,704	11,298	134,853	148,121	161,688	99,702	-	-	3,614,187	3,315,290	3,132,827
Sales of Seedlings	2,802,820	982,500	16,663,461	1,837,912	3,254,017	3,111,915	1,637,650	3,119,975	2,566,215	12,432,700	-	-	48,409,166	64,838,268	57,192,846
Sales of Sundries	4,324,842	880,106	292,748	1,788,638	156,316	164,505	80,710	484,853	26,170	1,639,384	-	255,715	10,093,985	15,549,750	12,785,261
Sales of Animali Produce and Animals	1,087,036			726,321					461,307		-	-	2,274,664	3,570,500	1,402,012
FD Interest Income											6,177,000	-	6,177,000	-	6,177,000
Total	**50,463,271**	**21,306,961**	**88,140,213**	**27,326,744**	**9,456,928**	**4,996,131**	**7,244,707**	**20,109,292**	**39,595,487**	**40,038,393**	**6,177,000**	**255,715**	**315,110,842**	**271,504,483**	**293,336,558**
COST OF PRODUCTION															
Direct Overhead															
Cultivation	1,786,827	1,264,679	1,166,937	1,173,710	226,205	158,973	894,633	824,363	956,396	643,536	-	-	**9,096,258**	**17,168,333**	9,695,643
Cost of Seedling	913,510	1,020,515	2,738,950	411,110	601,056	1,378,669	1,210,481	1,051,682	423,469	5,063,742	-	-	**14,813,182**	**38,391,185**	17,886,841
Harvesting	2,481,996	1,519,612	3,873,196	2,479,316	742,370	179,509	359,404	984,933	1,699,470	2,671,027	-	-	**16,990,833**	**20,907,630**	16,624,020
Curing into Copra/ Dispose	3,547,110	174,013	167,178	223,561	325,774	7,760	65,087	146,726	70,670	207,718	-	-	**4,935,598**	**1,629,213**	3,299,327
Animal Husbandry	1,540,943	41,608	1,025,048	714,800	10,153				529,720		-	-	**3,862,272**	**3,939,000**	3,607,037
Upkeep	6,515,883	2,330,508	9,580,819	1,984,489	387,627	66,862	1,034,050	1,761,152	1,933,832	6,393,016	-	-	**31,988,238**	**44,096,581**	35,310,512
Total	**16,786,269**	**6,350,936**	**18,552,129**	**6,986,986**	**2,293,183**	**1,791,773**	**3,563,655**	**4,768,855**	**5,613,557**	**14,979,038**	-	-	**81,686,381**	**126,131,942**	**86,423,381**
STOCK AS AT 01-01-2021	14,254,526	4,087,827	18,807,640	9,413,558	372,568	1,987,796	1,866,117	3,187,376	15,486,707	13,196,623	-	644,058	**83,304,796**		95,158,482
STOCK AS AT 31-12-2021	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	**131,597,794**		83,304,796
	12,522,837	4,244,958	13,250,648	(8,666,523)	222,590	580,802	(591,681)	592,601	3,375,280	7,278,032	-	583,838	33,393,383	126,131,942	98,277,067
GROSS PROFIT/LOSS	37,940,434	17,062,003	74,889,565	35,993,267	9,234,337	4,415,328	7,836,388	19,516,691	36,220,207	32,760,361	6,177,000	(328,123)	281,717,458	145,372,541	195,059,490
Other Overhead															
General Charges	11,549,506	6,943,002	13,630,446	6,801,557	2,316,856	987,064	3,607,795	6,421,356	7,615,516	12,879,646	7,501,279	166,139	**80,420,162**	**72,641,931**	76,826,646
Staff Salaries	4,831,288	2,056,830	3,867,963	1,988,860	722,905	752,217	1,880,054	2,822,642	1,877,545	4,123,938	5,190,328	-	**30,114,570**	**31,992,610**	31,329,752
Amortisation	1,400,884.62	391,560.62	1,076,847.55	268,585.03	168,318.51	-	1,811,470.34	495,466.17	201,000.66	2,330,732.14	-	-	**8,144,866**	-	8,062,308
Depriciation	1,408,919	736,599	1,090,456	305,525	73,298	199,518	446,216	451,112	1,256,351	817,506	-		**6,785,499**		6,828,143
Total	**19,190,598**	**10,127,992**	**19,665,712**	**9,364,527**	**3,281,378**	**1,938,799**	**7,745,535**	**10,190,576**	**10,950,413**	**20,151,822**	**12,691,607**	**166,139**	**125,465,097**	**104,634,541**	**123,046,849**
PROFIT/LOSS	18,749,836	6,934,011	55,223,852	26,628,741	5,952,959	2,476,530	90,853	9,326,115	25,269,794	12,608,539	(6,514,607)	(494,262)	156,252,362	40,738,000	72,012,642
OTHER COMPREHENSIVE INCOME /EXPENSE															
Acturial Gain/Loss	1,402,214	365,728	492,787	375,046	255,567	10,813	77,120	231,516	375,784	892,175	-	-	**4,478,750**		(14,365,392)
NET PROFIT/LOSS	**20,152,051**	**7,299,740**	**55,716,640**	**27,003,787**	**6,208,526**	**2,487,342**	**167,973**	**9,557,631**	**25,645,578**	**13,500,714**	**(6,514,607)**	**(494,262)**	**160,731,111**	**40,738,000**	**57,647,249**

The Total Expenditure is as follows

Total of Direct overhead	*81,686,381*
Total of Other overhead	*125,465,097*
Acturial Gain/Loss	*(4,478,750)*
Stock Varience	*(48,292,998)*
	154,379,730

Notes to the Financial Statements

As at 31 December

		2021 BUDGET Rs.	2021 ACTUAL Rs.	2020 ACTUAL Rs.
Note 03	**TRANSFERS FROM TREASURY & OTHER ENTITIES**			
	RECURRENT GRANT	280,000,000	257,300,000	252,500,000
	ESTATE PROFIT TRANSFER	7,000,000	7,000,000	5,000,000
		287,000,000	**264,300,000**	**257,500,000**
Note 05	**OTHER REVENUE**			
	INTEREST ON LOAN & INVESTMENT		991,406	871,281
	INCOME FROM MOTOR VEHICLES		299,853	435,498
	SUNDRY INCOME		6,813,391	3,275,696
	SALES OF PHEROMONE		66,845	70,235
	INCOME PROJECTS		346,360	118,819
	RESEARCH & DEVELOPMENT WRITE OFF		35,428,382	36,788,703
	ASSETS & AMORTISATION WRITE OFF		26,071,864	26,713,453
	PROJECTS EXPENSES WRITE-OFF		1,354,668	99,485
		-	**71,372,769**	**68,373,169**
Note 06	**WAGES SALARIES AND EMPLOYEES' BENEFITS**			
	SALARIES ALLOWENCES & OVER TIME	164,567,000	157,762,761	160,620,995
	BOARDS CONTRIBUTION TO ETF/EPF	25,309,000	25,530,760	25,547,460
	BOARDS CONTRIBUTION TO MEDICAL AID	9,454,000	8,920,028	9,296,990
	COCONUT ALLOWANCES	1,000,000	1,917,770	2,120,228
	CURRENT SERVICE COST-EST	10,000,000	9,990,805	8,884,384
	INTEREST COST-EST		7,157,478	7,929,684
		210,330,000	**211,279,603**	**214,399,742**
Note 07	**SUPPLIES AND CONSUMABLES USED**			
	SUPPLIERS AND CONSUMABLES	10,400,000	11,490,322	11,050,988
	CONTRACTUAL SERVICES	27,175,000	11,899,940	9,238,161
	MAINTENANCE	26,670,000	29,173,207	40,785,421
		64,245,000	**52,563,469**	**61,074,571**

Notes to the Financial Statements (Contd...)

Note 08

RESEARCH & DEVELOPMENT EXPENCES WRITE OFF

Description (Thrust Area)	CODE	WRITE OFF YEAR 2021	WRITE OFF YEAR 2020 Rs.
(1) Crop Protection			
1.1Crop Protection Division			
Major Pests	257		-
Diseases	259	600,728.98	370,256
Protection services	260	969,928.84	1,768,756
Waligama Leaf Wilt Disease	287		
Plesisps Beetle	290	84,295.80	77,975
		1,654,953.62	**2,216,987**
(2) Crop Production			
2.1 Agronomy Division			
Soil Moisture Conservation	261	334,280.00	1,021,540.94
Low Yielding Palms	262		
Farming System	263	244,535.58	465,334.47
Bio-energy Production	264	41,159.93	88,176.71
Inter Cropping	265	102,613.51	719,597.48
Poverty Alleviation Studies	267	2,472,934.81	1,547,785.56
Animal Husbandry	268	103,628.76	217,195.86
	269	650.00	
Coconut Planting Systems	270	13,350.00	534,108.94
Organic Farming	271		
Decline(LSD)and Weligama Coconut Leaf Wilt Disease	467	889,119.37	
prokaryotes in LSD and WCLWD affected palms &	468	515,136.96	
insecticide by nanotechnology	469	24,964.24	
Evaluation of Neoseiulus paspalivorus as a predatorymite of the coconut mite	470	29,104.49	
Studies on Whitefly of coconut palm	471	80,435.12	
Security Research	472	25,279.78	
Production and supply of pheromone	473	60,181.60	
		4,937,374.15	**4,593,740**
Pest & Diseases Management	298		
		-	-
2.2 Soil & Plant Nutrition Div.			
Low cost Material	272	24,432.00	6,025
Fertilizer Mixture	273	321,840.00	978,227
D.F.R.	274	1,690,946.43	2,726,147
Micronutrients	275		
Irrigation	277	89,516.20	221,717
Nutrient Mapping	278		
Organic Manure	279	133,011.63	676,545
	280	786.00	
Land suitability assesment	288	117.68	5,220
	289	1,500.00	
		2,262,149.94	**4,613,881**

Notes to the Financial Statements (Contd..)

Description (Thrust Area)	CODE	WRITE OFF YEAR 2021	WRITE OFF YEAR 2020 Rs.
(3) Crop Improvement-GPBD			
Dev. New co. Cultivars	281	781,989.07	2,178,388
Conse. Eva. Co. Germplasm	282	1,609,964.47	1,333,185
		2,391,953.54	**3,511,572**
(4) Coconut Processing-CPRD			
Improv.Kernal Based Product	225	1,489,046.69	433,445
Sap Based Product	226	584,046.10	737,740
Project on Coconut Oil	255	2,629,695.03	3,280,284
		4,702,787.82	**4,451,469**
(5) Agriculture Economics			
Socio Economy Studies	286	255,874.17	398,473
		255,874.17	**398,473**
Total		**7,350,615.53**	**19,786,123**
(6) Development & Services Related to Crop Production			
Drought Study - Middeniya (ppd)	400		
Phosphate Sources - Middeniya (ppd)	401	2,270,301.71	1,488,838
Monthly Harvesting Impact(ppd)	402	272,131.90	1,050,008
Devlopment & Maintenance of Middeniya R.C.(ME)	403	2,600.00	47,450
Assessment & Improv. Of soil Quality Dep.Co.Land	404	4,250.00	-
Yield Improv.Co. Land by Rain Water Harve. Tech.	407	1,473,547.68	982,050
Consumer survey Nut Consumption & coco. Oil	408		55,225
Production of Dihaploids (TCD)	409	1,600.00	66,563
A Morcular Approach to Investigate Genotypic Specifically	446		18,000
Mass Production of genetically improved Planting matirial	447	4,839.25	171,101
		4,029,270.54	**3,879,233.51**
(7) Development & Services Actvities Related to Genetical Improvement of Coconut (Gpb)			
Construction of a Coconut Genome map	411		21,264
Estab. P.S.G. for mass Production of CRISL98	414	41,216.00	51,260
Upgrading ISG to Increase the Produ. Of CRIC 65	415	411,262.24	419,956
Function of the Seed Production Unit	417	1,491,263.05	3,450,025
Molecular Applications in Coconut Breeding	475	30,786.20	
Development of Heat and Drought Tolerant Coconut Cultiva	476	178,250.00	
Development of New Cutivars Resisitant to Pest and Diseas	477	469,579.67	
		2,622,357.16	**3,942,505**
(8) Development & Services Related to Crop Protection			
Coconut Mite Research & Development (Cpd)	418	31,203.16	671,645
Extension Programs for Mite Management	419	408,024.14	324,909
Impact of mite damage on yeild at spatial & temp.scale	420	125,958.81	105,081
Manag. Of black beetal using pherom. & Oryctes(Cpd)	433		-
		565,186.11	**1,101,635**

Notes to the Financial Statements (Contd..)

Description (Thrust Area)	CODE	WRITE OFF YEAR 2021	WRITE OFF YEAR 2020 Rs.
(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	129,911.58	225,706.69
Dev.& Impro. Coconut fibre based Products	424	330,654.59	761,982.11
Pet Resistance of Coconut Varieties	427	25,871.80	6,557.50
Oil Palm Research & Development	428		1,500.00
Manag. Of black beetal using pherom. & Oryctes(Cpd)	433		
		486,437.97	**995,746**
(11) Agricultural Economics			
Mechanization & the demand of machnery co. Indus.	438	67,452.50	47,534
Conduting surveys to assess the impact of release of predator mites to control Aceria mite	464	12,340.84	
Value chain analysis of different sectors in coconut industry	465	46,523.69	
Genarate a knowledge base of the structural transformation of coconut sector and propose policies to increase the efficiancy of the industry	466	13,290.86	
		139,607.89	**47,534**
(12) Transfer of Technology			
Eletronic print media & Techn. transfer Prog (ext)	441	9,867,900.99	3,127,762
Development of field models & exhibits (ext)	442	24,575.43	3,820,216
Impro. Farm practies in mini coco. Trangle Hambanthota (ext)	444	426,409.00	87,947
Improvement of microclimatic conditions	478	17,305.00	
Heat & drought Tolerance	479	350,973.00	
Agromet Stations	480	111,866.35	
Development of new fertilizer package / placement techniques for coconut(2018-2023)SPND	481	180,852.50	
Mass production of genatically improved planting material through	482	400,547.17	
		11,380,429.44	**7,035,926**
Total		**35,428,382.35**	**36,788,702.51**
GRAND TOTAL		**35,428,382.35**	**36,788,702.51**

OTHER EXPENSES	2021 BUDGET Rs.	2021 ACTUAL Rs.	2020 ACTUAL Rs.
TRAVELLING	2,155,000	896,890	896,185
EXPENSES- PROJECTS		12,877,003	14,965,257
EXPENSES- CESS		3,518,540	3,536,734
BOARD MEMBERS FEES	970,000	538,554	448,823
WELFARE	5,800,000	4,546,857	3,170,283
OTHER OPERATING EXPENSES	3,500,000	1,507,672	941,081
EXPENSES OF C.P.M COURSE		191,665	983,150
ASSET DISPOSAL LOSS		-	4,186,945
	12,425,000	**24,077,180**	**29,128,457**

Notes to the Financial Statements (Contd...)

As at 31 December

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 2021 Rs.	TOTAL 2020 Rs.
COST									
AS AT 01-01-2020	1,539,783,874	302,473,627	176,549,260	337,493,049	91,133,707	71,324,244	28,946,505	2,547,704,266	2,529,849,230
ADDITIONS		4,007,651	9,099,854	52,215,873	7,748,500	7,570,897	819,038	81,461,811	34,453,250
DISPOSALS		-	4,130,000	-	85,647,602	-	-	89,777,602	16,598,214
REVALUATION					106,452,364			106,452,364	
AS AT 31-12-2021	**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**
ACCUMULATED DEPRECIATION									
AS AT 01-01-2020	-	118,786,085	58,656,332	156,961,044	83,461,071	53,179,417	18,429,480	489,473,429	451,110,397
ADDITIONS		12,261,478	8,620,963	19,752,018	2,186,531	4,908,722	1,476,935	49,206,647	49,881,801.00
DISPOSALS					85,647,602			85,647,602	11,518,769
AS AT 31-12-2021	**-**	**131,047,563**	**67,277,295**	**176,713,062**	**0**	**58,088,139**	**19,906,415**	**453,032,474**	**489,473,429**
CARRYING VALUE	-	118,786,085	58,656,332	156,961,044	0	53,179,417	18,429,480	403,825,827	439,591,628
WORKING PROGRESS								**100,788,169**	97,806,110
AS AT 31 DECEMBER 2020	1,539,783,874	175,433,714	114,241,818	212,995,860	119,686,969	20,807,002	9,859,128	**2,293,596,535**	**2,156,036,948**
AS AT 31 DECEMBER 2020	1,539,783,874	183,687,542	117,892,928	180,532,005	7,672,636	18,144,827	10,517,025		
AMORTIZATION - ESTATE IMPROVEMENT	8,620,963								
ASSETS DEPRECIATION - ESTATES	6,785,499								
ASSETS DEPRECIATION - CESS PROJECTS	3,518,540								
ASSETS DEPRECIATION - DONOR PROJECTS	8,541,081	27,466,084							
ASSETS DEPRECIATION - HEAD OFFICE	21,740,564								
INTANGIBLE ASSET AMORTIZATION	68,890.47	21,809,454							
		49,275,537.83							

In the year 2021, a revaluation was carried out by examiners of motor vehicles of the Department of motor Traffic on the31st december 2021 to reflect market value of vehicles.The resultant Surplus of LKR 106,452,364.12 has been credited to the Revaluation/Capital reserve on revaluation of vehicles. (Details are attached from page no 3-6 in Schedules)

Notes to the Financial Statements (Contd...)

As at 31 December

		2021 ACTUAL Rs.	2020 ACTUAL Rs.
Note 11	**INTANGIBLE ASSETS**		
	Cost		
	Balance as at 01.01.2021	1,377,809	-
	(+) Addition during the year	1,280,880	1,377,809
	(-) Dispose During the year	-	
		2,658,689	1,377,809
	Accumulated Amortisation		
	Balance as at 01.01.2021	65,214	
	(+) Addition during the year	68,890	65,214
	(-) Dispose During the year	-	
		134,104	65,214
	Carrying value	**2,524,585**	**1,312,596**
Note 12	**BIOLOGICAL ASSETS**		
	LIVE STOCK	34,970,430	31,869,680
		34,970,430	**31,869,680**
Note 13	**OTHER NON FINCIAL ASSETS**		
	LIBRARY BOOKS & PERIODICALS	4,080,520	3,159,059
		4,080,520	**3,159,059**
Note 14	**OTHER NON CURRENT ASSETS**		
	DISTRESS & FRIDGE LOAN	16,402,734	16,238,852
	TRANSPORT LOAN	897,250	1,159,250
	ESTATE FUND INVESTMENTS	42,600,000	42,600,000
	INTEREST RECIEVABLE ON FD -LONG TERM	27,269,340	21,092,340
		87,169,324	**81,090,442**
Note 15	**CASH & CASH EQUIVALANTS**		
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002507	6,137,899	6,343,859
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002942	66,438,803	22,924,800
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002556	7,131,458	24,463,048
	BANK OF CEYLON - DANKOTUWA - A/C NO 3003088	155,575,445	61,992,056
	BANK OF CEYLON - DANKOTUWA - A/C NO 000001528	2,339,434	1,195,204
	BANK OF CEYLON - DANKOTUWA - A/C NO 82721768	7,801,298	7,995,059
	BANK OF CEYLON - DANKOTUWA - A/C NO 84044222	557,467	477,967
		245,981,804	**125,391,992**
	SAVINGS DEPOSITS		
	BOC - NEGOMBO	5,000	5,000
		5,000	**5,000**
		245,986,804	**125,396,992**

Notes to the Financial Statements (Contd...)

		2021 ACTUAL Rs.	2020 ACTUAL Rs.
Note 16	**RECIEVABLES**		
	SALES LEDGER CONTROL ACCOUNT	30,454,286	31,435,060
	LESS - BAD & DOUBTFUL DEBTS PROVISION FOR THE YEAR	(433,487)	(433,487)
		30,020,799	**31,001,574**
	POST MASTER GENERAL	31,620	31,620
	INTEREST RECIEVABLE ON FD	-	-
	SALARIES CONTROL	6,000	-
		30,058,419	**31,033,194**
Note 17	**INVENTORIES**		
	COCONUT	68,911,856	26,909,703
	COPRA	397,495	230,647
	GENERAL STORES/ESTATE	4,617,159	4,839,733
	FERTILIZER	5,129,684	2,088,376
	CHEMICAL & GLASSWARE	25,766,703	20,032,630
	SEEDLING STOCKS	27,001,503	23,676,908
	STOCK OF PUBLICATIONS	3,498,267	4,150,724
	RED WEWIL EQUIPMENTS	204,750	-
	POLY BAGS	8,200,779	3,628,454
	ROPES	1,288,600	1,436,000
	COCONUT OIL	264,990	-
		145,281,786	**86,993,175**
Note 18	**PREPAYMENTS**		
	INSURANCE	380,434	490,529
		380,434	**490,529**
Note 19	**OTHER CURRENT ASSETS**		
	ADVANCE TO LOCAL SUPPLIERS	26,645,940	9,056,006
	ADVANCE TO STAFF	60,000	139,400
	MOBILIZATION ADVANCE & PURCHASE AD:(OVERSEAS)	820,620	2,387,890
	SECURITY DEPOSIT RECIEVABLE	245,650	245,650
	DISTRESS LOAN	6,363,759	6,835,354
	TRANSPORT LOAN	512,423	662,923
	FESTIVAL ADVANCE	592,550	723,800
	SPECIAL ADVANCE	800	84,000
	SPECIAL SALARY ADVANCE	100,500	102,900
	FESTIVAL ADVANCES TO LABOURERS	489,616	460,716
	SPECIAL SALARY ADVANCES TO LABOURERS	112,800	97,800
	PETTY CASH -ISG	-	102,750
	PETTY CASH -MID	-	50,000
	PETTY CASH -SPND	-	1,030
		35,944,658	**20,950,219**

Notes to the Financial Statements (Contd...)

		2021 ACTUAL	2020 ACTUAL
		Rs.	Rs.
Note 20	**PAYABLES**		
	ACCRUED EXPENSES	48,398,364	46,647,223
	EXPENCE CREDITORS	9,670,915	2,180,031
	UCLAIMED WAGES	39,421	36,921
	UNPAID SALARIES	1,200	200
	PROVISION FOR AUDIT FEES	800,000	800,000
	EPF/ETF PAYABLE	698,489	550,647
	SECURITY DEPOSITS	855,953	998,399
	RETENTION	5,138,887	7,187,069
	SECURITY DEPOSIT STAFF	49,000	49,000
	TENDER DEPOSIT PAYABLE	416,500	1,248,550
	SUNDRY PAYABLES	522,586	497,586
	UNPAID SUPPLIERS	20,250	13,250
		66,611,564	**60,208,877**
Note 21	**NON CURRENT LIABILITIES**		
	PAYABLES	1,075,000	-
	CONTRIBUTED CAPITAL - PROJECTS	129,582,057	173,256,556
		130,657,057	**173,256,556**

NOTES TO THE FINANCIAL STATEMENTS - 2021

As at 31st December	2021 Rs. Cts.	2,020 Rs. Cts.
NOTE 22 - EMPLOYEE BENEFITS		
The amounts recognized in the Statement of Financial Position are determined as follows:		
Present value of obligation	174,274,175	166,538,058
Liability in the statement of financial position	**174,274,175**	**166,538,058**

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	**166,538,058**	**157,280,087**
Over/Under Provision	(1,552,892)	(774,206)
Current service cost	16,056,830	14,539,077
Interest cost	11,657,664	11,009,606
Actuarial loss /(gain)	(5,283,133)	(7,864,904)
	187,416,527	174,189,660
Payments made during the year	(13,142,352)	(7,651,601)
Balance as at the end of the year	**174,274,175**	**166,538,058**

The amounts recognized in the statement comprehensive income are as follows:

	Rs. Cts.	Rs. Cts.
Current service cost	16,056,830	14,539,077
Interest cost	11,657,664	11,009,606
Total Included in the staff cost (Note 07)	**27,714,494**	**25,548,683**
Actuarial loss /(gain)	(5,283,133)	7,864,904
Total included in statement comprehensive income	**27,714,494**	**25,548,683**

The key assumptions used by the Management

Rate of Interest %(5 year Average corporate bond rate)	7% p.a	7% p.a
Expected Salary Increment %	**10**	**10**
Staff Turnover Factor %	**15**	**15**
Retirement age	**60**	**60**

Notes to the Financial Statements (Contd...)

NOTE 23 - PRIOR YEAR PROFIT ADJUSTMENTS

DESCRIPTION	AMOUNT
OVER 3 YEARS UNRELEASED TENDER DEPOSIT IDENTIFYING AS A INCOME	713,050.00
SETTLEMENT OF PETTY CASH IMPREST 2020 OF MIDDENIYA R.C	(50,000.00)
ADJUSTMENT OF TWICE ACCOUNTED BUILDING MAINTENANCE COST IN 2020	2,163,798.30
ADJUSTING THE AMOUNT RECEIVED IN 2021 FOR THE DISPOSED ITEMS OF 2020.	2,682,026.00
PROJECT EXPENSES WRITE OFF	111,472,750.00
ADJUSTMENT OF THE PURCHSE OF COCONUT HUSK EXPENSE TO PREVIOUS YEAR	(4,130,000.00)
ADJUSTMENT OF OVER STATED LIABILTY AMOUNT	166,270.83
ADDING THE FERTILIZER STOCK IN THABBOWA RC WHICH WAS NOT CONTAIN IN THE CURRENT STOCK	18,364.46
SALES LEDGER CONTROL ADJUSTMENT	(10,855,702.16)
STOCK ADJUSTMENT OF THABBOWA R C	(22,850.00)
ADVANCE SETTLEMENT OF THE PUMP HOUSE IN ISG	(202,150.00)
RELEASING THE WRITTEN-OFF TENDER DEPOSIT AMOUNT	(2,000.00)
ADJUSTMENT FOR THE CANCELLATION OF ADVANCE	(24,750.00)
PRIOR YEAR GRATUITY UNDER PROVISION ADJUSTMENT	1,552,891.92
RENT PAYABLE TO CCB FOR WELIGAMA NURSARY	(1,100,000.00)
INSURANCE OVER EXPENDITURE ADJUSTMENT IN 2020	15,400.00
TOTAL	**102,397,099.35**

Notes to the Financial Statements (Contd...)

DISCLOSURES

01) Actions have been taken to filled 09 cases against third parties by the CRI and 09 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	Payment has been made to send the summons to the foreign address & necessary information has been sent to the court.a letter has also been sent to the attorney general with a copy to the attorney at low Ms.Abhigale Jayakody to expedite further action in this regard. Next hearing date is 2022.04.06
b)	Dr.(Mr).K.B.Dasanayake	2,039,715.00	The accused has informed the institution of his willingness to settle the case and accordingly further proceedings are to be taken in court in this regard. Next hearing date is 2022.02.15
c)	Mrs.M.G.F.S.Jayasundara	3,345,424.66	It is stated that there is a problem with foreign address of this depfendant.But a new address was revealed through the internet & informed it to the lawyer on 2017.10.20.Further,summons of the 2nd & 3rd defendant have been returned due to unavailability.Divisional secretary also has informed that the defendant was not available in this address(Case No.1917/M).a letter has also been sent on 2021.11.22 to the attorney general with a copy to the attorney at low Ms.Abhigale Jayakody to expedite further action in this regard.
d)	Dr.(Mr).N.A.K.De Silva	3,204,297.60	Written evidence was sheduled to be given on 2021.11.19 and the case was adjourned till 2022.03.08 as the lawyer were not present on that day.
e)	Dr.(Mrs).J.M.M.A.Jayasundara	847,880.00	necessary information has been sent to the court.a letter has also been sent to the attorney general with a copy to the attorney at low Ms.Abhigale Jayakody to expedite further action in this regard.
f)	Mr.H.P.S.Jayasundara	2,078,905.33	Department of attorney General has requested from the CRI to inform about the present Address of this defendant by the letter no:C/184/99/CRB(RW) dated on 30.01.2019, and correct address has been already informed by the CRI.and also, Letter of Reminder was sent back on 20.11.2019.necessary information has been sent to the court.a letter has also been sent to the attorney general with a copy to the attorney at low Ms.Abhigale Jayakody to expedite further action in this regard.

g)	Mrs.P.G.P.Hewawitharana	1,059,170.00	She has been informed to pay off the total bond value of Rs.2,993,945.18. But she has already paid the sum Rs.1,934,775.18.The balnce amount is Rs.1,059,170.00.She has requested to discuss with the department of attorney general to pay off this balance amount throuth her lawyer.But,the Board has decided to continue the case .documents have been submited to the court on 2021.10.07.
h)	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.
i)	Dr(Mrs.).H.M.I.K.Herath	3,090,747.03	the case is being examining & next hearing date is 2022.02.15

Cases Filed against the Institution

	Name	Court	Reason & Present situation
a)	Krishna Kumar (Checkroll labour at ISG)	High court -Chilaw	Re-employment of gratuity with post pay and obtaining compensation for dismissal.(The case is pending). The verdict will be announced in january 2022
b)	Department of Forest Conservation	Magistrate Court-Chilaw	Cutting Down 172 teak trees at Rathmalagara Research Centre.A total of 112 trees were identified as belonging to the Coconut Research Institute and were released. The trial is still underway to establish the ownership of 60 trees.This case was adjourned till 25.02.2022
c)	Sarath pushpakumara (Labour of Pallama G R C)	Labour Tribunal Chilaw	Prosecution of Institution for preliminary investigation in to suspension for illegal logging.the verdict will be announced in january 2022
d)	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.
e)	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.
f)	Elpitiya Plantation Industries Kegalle Plantation Industries	court of Appeal	Violation of Fundamental Rights in Prohibition of Palm oil Cultivation.the case is been examined.
g)	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.

h)	Lalan Rubber (pvt) Ltd	court of Appeal	Violation of Fundamental Rights in Prohibition of Palm oil Cultivation.the case is been examined.
i)	W.G.R Subathma (TTD Division)	Supreme Court	A fundamental right case has been filed regarding her transfer.

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) The following Funds have been credited to the Capital Current Account (Ac No.3002556) of the Coconut Research Institute in 2018, which have been allocated for the following specified tasks of the CRI but not Utilized. Remaining balance of this fund as at 31.12.2019 is Rs.7,362,408.41 Because the fund was utilized for the payment of construction of New laboratary complex.

Rs.10,000,000.00	Sold amount of the Land of Makandura Seed Garden to the wayamba University.
Rs. 9,522,210.00	Returned amount from the Ceylon Electricity Board of the Payment for the Supply of 3 Phase Electricity to the Poonarin Seed Garden.
Rs. 4,110,400.00	Returned amount from the SL Army of the payment for the Clearence the Land of Poonarin Seed Garden.

04) A stock of obsolete chemicals worth Rs.336,391.90 have been removed from use.

05) The state ministry of Coconut,kithul, & palmyrah cultivation promotion & Related industrial Product Manufacturing & Export Diversification has given Rs.10,986,882.12 to the Coconut Research Institute to pay an advance to the kurunegala Plantation for the irrigation system.

Continue....

06). Committed Liabilities for the Year 2021 are as Follws

PROJECT

Company Name	Item	Amount Rs.	PO No	Div
Hemsons Internationl (Pvt) Ltd	Test Sieve Set	295,358.40	0845	GPB, Pallama
Hemsons Internationl (Pvt) Ltd	Test Sieve Set	147,679.20	0845	GPB, Pallama
Neochem International (Pvt)Ltd	Fluid Bed Dryer	2,615,119.56	0849	GPB
Neochem International (Pvt)Ltd	Fluid Bed Dryer	5,230,239.12	0849	GPB
Analytical Instruments (Pvt)Ltd	Fluid Bed Dryer	4,859,136.00	0851	Pallama
Analytical Instruments (Pvt)Ltd	RTPCR kits	1,056,783.24	0999	CPD
Hemsons Internationl (Pte) Ltd	Chemical	245,000.00	1007	CPRD
Neochem International (Pvt)Ltd	Chemical	171,396.00	1008	CPRD
Analytical Instruments (Pvt)Ltd	Glassware	85,619.16	1009	CPRD
None	Open Polinated Seedlings	187,500.00		GPB
		14,893,830.68		

ESTATE

Company Name	Item	Amount Rs.	PO No	Estate
UPS Tyre & Auto Centre	Tyre	131,980.00		BRC
EWIS Peripherals (Pvt) Ltd	Toner	37,260.00	0794	EMD
Sri Lanka State Trading (Gen) Cop	Brush Cutter	117,000.00	1039	EMD
Right Technology Holdings	Desktop Computer	1,459,500.00		Pallama/RE/BE/ EMD
Right Technology Holdings	MS License Pack	324,500.00		Estate
Metropolitan Technologies	Laser Printer 03	162,000.00		Estate
Metropolitan Technologies	Colour L/Printer 01	106,272.00		Estate
Metropolitan Technologies	Multifunctional Printer	118,800.00		Estate
ABN Traders	UPS	229,000.00		Estate
St Patrick Iron Works	2 Wheel tractor trailer	180,000.00		Estate
St Patrick Iron Works	Weed Slasher	870,000.00		Estate
St Patrick Iron Works	Disk Plough	195,000.00		Estate
St Patrick Iron Works	Tine Tiller	80,000.00		Estate
Madushan Motors	Tinkering & Painting	485,000.00		Estate
Associated Motorways (PVT) Ltd	Windscreen Repair	150,559.56		Estate
Nemico Air Conditioner	Repairing Di Freezer Machin	95,000.00		Estate
Nemico Air Conditioner	Repairing 12000 BTU Air Co	195,000.00		Estate
None	Polination Bag	800,000.00		PSG
		5,736,871.56		

CHEMICAL

Company Name	Item	Amount Rs.	PO No	Div
Neochem International	Chemical	154,613.88	0120	TCD
Analytical Instruments (Pvt)Ltd	Chemical	23,523.48	0735	GPB
Avon Pharmo Chem	Chemical	3,804.84	0413	CPD
Avon Pharmo Chem (Pvt)Ltd	Chemical	27,206.20	0705	CPD
Analytical Instrument	Chemical	74,563.20	0409	CPD
Hemsons Internationl (Pvt) Ltd	Chemical	17,420.40	0908	CPD
Avon Pharmo Chem	Chemical	22,604.40	0429	CPD
Analytical Instruments (Pvt)Ltd	Chemical	20,536.20	0524	AGRO
Lionchem	Chemical	5,994.00	0058	AGRO
Neochem International (Pvt)Ltd	Chemical	59,486.40	0765	CPRD

Notes to the Financial Statements (Contd...)

Company Name	Item	Amount Rs.	PO No	Div
Analytical Instruments (Pvt)Ltd	Chemical	147,165.50	10125	CPD
Avon Pharmo chem (Pvt) Ltd	Chemical	4,798.95	10844	TCD
Avon Pharmo Chem (Pvt) Ltd	Chemical	42,807.35	10906	GPB
Organic Trading (Pvt) Ltd	Chemical	20,730.25	10955	CPRD
Hemsons Internationl (Pte) Ltd	Chemical	22,626.25	10958	CPRD
Avon Pharmo chem (Pvt) Ltd	Chemical	32,538.65	10959	CPRD
Analytical Instruments (Pvt)Ltd	Chemical	5,003.62	11082	CPD
S & D Associates	Chemical	67,692.95	11085	CPD
Hemsons Internationl (Pte) Ltd	Chemical	174,610.83	11210	SPND
Analytical Instrument (Pvt)Ltd	Chemical	29,713.61	11243	SPND
Organic Trading	Chemical	34,560.00	0045	SPND
Hemsons International	Chemical	35,359.20	0057	AGRO
Avon Pharmo Chem	Chemical	124,740.00	0173	GPB
Biomedite	Chemical	8,100.00	0174	GPB
Avon Pharmo Chem	Chemical	20,557.80	0376	SPND
Jeiotech Equipment Company	Chemical	38,000.00	0378	SPND
R S Global Traders	Gloves	35,250.00	0417	CPD
Avon Pharmo Chem	Chemical	51,187.68	0434	CPRD
Exodus Lab tech	Chemical	914,000.00	0454	SPND
Avon Pharmo Chem	Chemical	92,545.20	0470	SPND
Avon Pharmo	Chemical	22,474.80	0523	AGRO
Analytical Instruments (Pvt)Ltd	Chemical	30,341.52	0690	PPD
Analytical Instruments (Pvt)Ltd	Chemical	21,639.96	0707	CPD
Neochem International (Pvt)Ltd	Chemical	39,147.94	0709	TCD
Neochem International (Pvt)Ltd	Chemical	189,291.60	0732	SPND
Avon Pharmo Chem (Pvt)Ltd	Chemical	11,262.24	0733	GPB
Organic Trading (Pvt) Ltd	Chemical	7,060.00	0738	GPB
Quolikem International (Pvt) Ltd	Chemical	100,764.00	0762	CPRD
Analytical Instruments (Pvt)Ltd	Chemical	69,134.04	0763	CPRD
Vextop Holdings (Pvt) Ltd	Glassware	34,500.00	0767	CPRD
Microtech Bioliogical (Pvt) Ltd	Chemical	29,052.00	0907	CPD
Neochem International (Pvt)Ltd	Chemical and Glassware	326,113.56	0909	CPD
Hemsons Internationl (Pte) Ltd	Chemical	107,420.20	1007	CPRD
Analytical Instruments (Pvt)Ltd	Glassware	85,619.16	1009	CPRD
Neochem International	Chemical	856,447.56		SPND
Analytical Instuments	Chemical	95,126.40		SPND
		4,337,135.82		

CAPITAL

Company Name	Item	Amount Rs.	PO No	Div
Analytical Instrument (Pvt) Ltd	Repairing of Fume Hood	200,000.00	12304	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Fume Hood	253,240.00	12304	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Block Digester	26,770.00	12316	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Block Digester	54,176.34	12316	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Block Digester	25,000.00	12316	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Block Digester	10,500.00	12316	SPN
Analytical Instrument (Pvt) Ltd	Repairing of Block Digester	47,093.74	12316	SPN
Rotak Instrument (Pvt) Ltd	Repairing of Water Purificati	437,000.00	12161	SPN
Qualitron (Pvt) Ltd	Repairing of Selecta Water D	7,500.00	12403	SPN
University of Peradeniya	Supply of Gene expression st	300,000.00	1059	GPB
University of Peradeniya	Supply of Gene expression st	200,000.00	1059	GPB

Notes to the Financial Statements (Contd...)

Company Name	Item	Amount Rs.	PO No	Div
University of Peradeniya	Supply of Gene expression st	100,000.00	1059	GPB
University of Peradeniya	Supply of Gene expression st	100,000.00	1059	GPB
University of Peradeniya	Supply of Gene expression st	64,123.00	1059	GPB
Altra Scientific Pvt Ltd	Lycopodium-100g	26,568.00	0961	GPB
Pro Creation	CRIC Stickers-14250Nos	99,750.00	1069	GPB
W. M Chandrathilaka	Husking,Sample Analysis,cur	452,250.00	0100	AGR
Avon Pharmo Chem	Micro pipette Stands	8,000.00	0414	CPD
Pro Creations	Printing	384,000.00	0093	TTD
Saduni Offset Printers	Technology Update Tamil	15,500.00	0446	TTD
Microtech Bioliogical	PPS	300,000.00	510511	PPD
Vijitha Yapa Book Shop	Library Book	127,635.00	0521	Library
State Printing Coporation	Eight Booklets	279,600.00	0624	TTD
Hemsons International	Water Bath	616,955.44	0722	SPND
Rotak Instruments (Pvt) Ltd	Magnetic Stirrer Hot Plate	300,000.00	0781	SPND
Analytical Instruments (Pvt)Ltd	YellowTips	16,686.00	0824	GPB
PoinetsScientific Instrumentation	Soil Mosture Sensing Syester	807,520.00	0844	Agro
Neochem International (Pvt)Ltd	Spinner	66,037.68	0853	CPD
Analytical Instruments (Pvt)Ltd	Kdjeldhal Heating Unit	681,048.00	0859	SPND
Medi Lab & Research Technologies (Pvt) Ltd	Glass Beads	14,000.00	0887	TCD
Hayeys Lifescience (Pvt) Ltd	PTFE Lid	128,286.72	0905	CPRD
Office Network (Pvt) Ltd	Labeling machine	99,684.00	0912	ACC
Analytical Instruments (Pvt)Ltd	Dissecting Stereo Microscope	1,024,850.00	0925	TCD
Creative Information Technologies	Computer Accsessories	70,000.00	0932	AED
Metropolitan Technologies (Pvt) L	Canon Cartridge	11,448.00	0947	GPB
Medi Lab & Research Technologies (Pvt) Ltd	Servicing Laminar Flow Air Cabinets	152,500.00	0963	TCD
Metropolitan Technologies (Pvt) Ltd	Laser Printer	108,000.00	0974	EST/TCD
Metropolitan Technologies (Pvt) L	Colour Laser Printer	106,272.00	0975	EST (HRO)
Analytical Instruments (Pvt)Ltd	Laboratory Oven	576,450.00	0984	CPD
Thiruna Printers & Publisher	Printing	425,850.00	1001	TTD
State Printing Coporation	Print Of Organic Fertilizer	137,538.00	1028	TTD
Olikro Machine & Tools	Chainshow Parts	5,850.00	1031	EST
Trade Premoters (Pvt) Ltd	Disel Generator	1,242,000.00	1046	EU
Anura Trade Center	Coconut Scraper	8,300.00	1050	EST
Metropolitan Technologies (Pvt) L	Scanner	108,000.00		IT
DR Industries	Furniture	161,625.00		CPRD
Enex Agencise	Furniture	62,629.20		CPRD
Sri Lanka Rupavahini Corporation	TV Programme	270,000.00		834
Creative Information Technologies (Pvt) Ltd	Laptop Battery	11,500.00	0929	EST(Director Office)
Metropolitan Technologies (Pvt) L	Toner	30,024.00	0941	EU
Sri Lanka State Trading (Gen) Cop	Photocopy Paper	626,974.50	1024	General Stores
Sri Lanka State Trading (Gen) Cop	Stationery	77,300.00	1025	General Stores
S.B.Printers (Pvt) Ltd	CR Book	26,000.00	1026	General Stores
Sri Lanka Telecome PLC	Officail Eamil Addresses Monthly Charge	546,000.00	1036	EST
Sri Lanka Rupavahini Corporation	Telecast of Documentarlas	3,888,000.00	1058	TTD
S/L Brocasting Corporation	Radio Programme	2,866,666.66	1060	TTD
Creative Information Technologies (Pvt) Ltd	Toner	7,500.00	1063	EST

Notes to the Financial Statements (Contd...)

Company Name	Item	Amount Rs.	PO No	Div
Creative Information Technologies (Pvt) Ltd	Toner	4,500.00	1074	EST
Samal Constructions	Growth Chambers	968,100.00		ENG
Samal Constructions	Water Retaining Structure BF	1,980,160.00		ENG
R.M. Rathnasiri	Masonry Work For Ho/Gr.04/04	124,605.50	986	EST
R.M.Ravindu Dilshan	Carpentery Work for Ho/Gr.04/04	70,315.00	987	EST
St Anthonys Glasss	Window Glasses	6,075.00	1096	EST
Wasana Hardware	Nail (500g)	180.00		EST
M.A.C.Hardware	Wood Protection	600.00		EST
Leela Tread Center	Maltibond , Sand Paper	625.00		EST
Caldera Hardware	Awul Pass, Bainding Wire	620.00		EST
Royal Factoring (Pvt) Ltd	Building Materials	52,000.00	0983	EST
		22,007,981.78		

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