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Our Vision

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

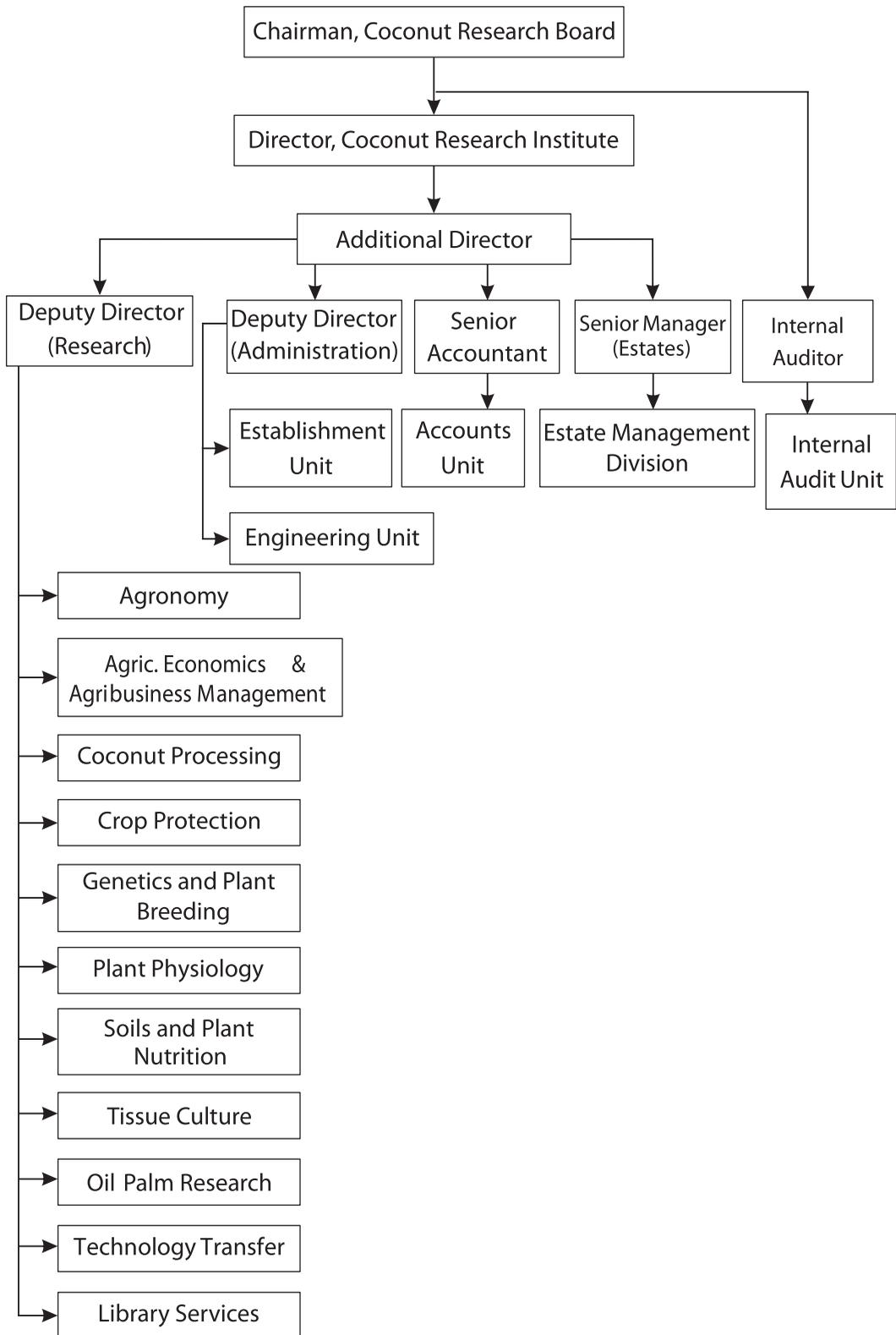
Our Mission

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

Our Mandate

1. 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
2. Conduct and further scientific research on processing and utilization of coconut products and value addition
3. Establish and maintain institutes' seed gardens and experimental stations
4. Train advisory and extension workers to assist the coconut industry
5. Guide and advise coconut industry on all matters of technical nature
6. Conduct R &D activities for development of the oil palm industry

ORGANOGRAMME OF THE INSTITUTE



MINISTRY OF COCONUT DEVELOPMENT AND JANATHA ESTATE DEVELOPMENT THE COCONUT RESEARCH INSTITUTE

SHORT ANNUAL REPORT – 2014

The Coconut Research Institute was founded in 1929 as the Coconut Research Scheme under the Coconut Research Ordinance N0.24 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 the Coconut Research Institute.

The Coconut Research Board

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.

The Members of the Board

Chairman	Prof. H.P.M. Gunasena, B.Sc. (Agric.Peradeniya), PhD (Reading, UK), D.Sc. (University of Rajarata, Sabaragamuwa and Wayamba), FNAS (SL)
Director	Dr. H.A.J. Gunathillake, B.Sc. (Agric.), PhD (Wales, UK)
Members	Dr. R.R.A. Wijekoon, B.Sc. (Agric.), M.Sc. (UK), PhD (Australia), Director General, Department of Agriculture
	Mr. S. Keerthiratne, ME (Uni. of Moratuwa), Chairman, Coconut Cultivation Board
	Mr. Anura Gunawardena, B.Com (Uni. of Colombo), Chairman, Coconut Development Authority
	Ms. T.Y.L. Munasinghe, B.Sc. (Agric.), Treasury Representative
	Mr. G.G.N. Gunarathne, BA (Uni. of Peradeniya), Senior Assistant Secretary, Ministry Representative
	Mr. Lalith Godamunne, BA Hons. (Uni. of Ceylon), Dip (Business Mgt., IMEDE), President, Coconut Growers' Association of Sri Lanka
	Mr. Ariyasena Gallege (Attorney-at-law)

Secretary-to-the-Board- Dr. L. C. P. Fernando, BSc. (Agric), PhD (Queensland, Aus.)

The Audit and Management Committee

Altogether four meetings were held during the year to discuss the Audit & Management Plan of the Institute.

Name	Record of Attendance (Jan. –Dec. 2014)
Ms.T.Y.L.Munasinghe(Chairman)	4/4
Mr.G.G.N.Gunarathne	4/4
Ms.Lalani Gunatileke, Observer/Superintendent of Audit	4/4
Mr.E.A.G.Ananda, Observer/Assist. Superintendent of Audit	0/1
Mr.Ariyasena Gallege	2/2
Dr.H.A.J.Gunathilaka, Director	4/4
Dr.L.C.P.Fernando, Additional Director & Convener	4/4
Mr.P.W.A.Fernando, Internal Auditor	4/4

Chairman's Message



It is a privilege to write this message to the concise annual report of the Coconut Research Institute of Sri Lanka for the year 2014 during which many accomplishments have been made. This period was eventful on all aspects of coconut development covering research and development, education, training and extension, private sector partnerships, international relations and services to the coconut sector.

As the mandated function of the institute, research was given the highest priority during the year under review. The institute was successful in prioritizing the research areas that has the highest potential to develop the coconut sector and published as the long-term Research Programme - 2015- 2017. The major research thrusts identified included development of high yielding, disease and pest resistant elite coconut varieties, breeding of tolerant varieties for the Weligama coconut leaf wilt disease, adaptation/mitigation of adverse effects of climate change variations on coconut yields, increasing productivity of coconut lands by intensifying land use practices, minimizing external resource use in coconut cultivation and organic coconut production, new product development to meet the changing national and international market demands, effective research methodology for information transfer to stakeholders and policy issues. For the first time in the history of the institute, a major achievement has been made in establishing joint research programmes with selected medical faculties of national universities to elucidate the health benefits of coconut oil and other coconut products, with particular reference to diabetes, artherosclerosis and neurologically degenerative diseases such as Alzheimer's. Hitherto, there is no authoritative published clinical evidence on the effectiveness of coconut products on these diseases. As already evident, the outcomes of these research is likely to elevate the coconut as the most demanding health food in the world.

During the year under review, the profile of the coconut Research Institute was elevated to an unprecedented level and became recognized as the world's best institute for scientific research on coconut development. This was clearly demonstrated at the International Conference and Coconut Festival 2014 held in Colombo organized by the Asian and Pacific Coconut Community (APCC) and hosted by the Coconut Research Institute/Ministry of Coconut Development and Janatha Estate Development. Outcome

of this prestigious status lead many coconut growing countries of Africa such as Tanzania, Kenya, Seashells and the private industry to seek assistance and enter into agreements with the institute to develop their coconut sectors. These achievements were the result of untiring efforts of a team of highly qualified and dedicated scientists of the institute with the cooperation extended by the private industry, university academics.

The success of the Coconut Research Institute has been its response to change in the production process and market developments which was inevitable. This institute has the highest capacity for research and development and deserves highest attention of the policy makers to harness its potential for development of the coconut sector for the benefit of its stakeholders and contribute to the economic development of the nation.

I wish its future endeavours all success.

The achievements during the year under review would not have been possible if not for the guidance, direction and support provided by Hon. Jagath Pushpakumara, Minister, Hon. Antony Perera, Deputy Minister and Mr. Nihal Somaweera, Mr. U. R. Seneviratne, Mr. W. M. Bandusena and Mr. Gamini Rajakaruna, Secretaries and other staff of the Ministry of Coconut Development and Janatha Estate Development. The Coconut Research Institute acknowledges the above, with deep sense of gratitude.



Prof. H. P. M. Gunasena
Chairman
Coconut Research Board

Director's Message



Sri Lanka has emerged as the fifth largest producer of coconut in the world. In the context of area of expansion, annual nut production and productivity for unit area there appears an increase. Research system is the basic requirement for improvement in production and productivity of coconut. This is backed by a strong research system in the form of Coconut Research Institute (CRI) of Sri Lanka. The research programme of the CRI is directed to improve crop production, crop protection, production of value added products and ultimately to increase productivity of coconut lands to maximize farmer's income.

As per the recent direction by the FAO and other world leading agricultural organizations, by the year 2030, the global agricultural production is needed to increase by 60%; 50% of energy for agriculture and 40% of fresh water for crop irrigation. Undoubtedly the research programme of the CRI also needs aligning in this direction. Hence, introduction of new coconut varieties having characters of drought and salinity tolerance, tolerance to climate changes including heat tolerance, adaptability for marginal soils, introduction of efficient new ranges of fertilizers, application of fertilizer in more efficient manner, introduction of effective estate management practices with mechanization are the new areas identified for productivity improvement.

Sustainable soil management is the key for long term productivity. It has been realized that lands are being subjected to degradation gradually by erosion and wrong agricultural practices. So, appropriate questions are addressed in the current research programme. Monoculture farming needs to change for coconut based farming systems. Hence, agroforestry and climate-smart agriculture are the new concepts in our R & D programmes.

Climate is becoming more and more adverse on crop production and productivity. Hence new incidences of pest damages and diseases will be the challenges. At present, priority is given for R&D in the management of coconut mite and Weligama Wilt Disease.

Recently, coconut processing research in Sri Lanka has been involved in product and process development. Many products out of coconut kernel, water, sap and husk have been developed. The most attractive products are the virgin coconut oil, coconut milk/powder, coconut ice cream, spray dried coconut treacle and the spray-dried sweet

toddy. Further, it was successful in processing coconut milk as pasteurized coconut milk pouch for domestic consumption. Coconut skim milk based yoghurt has developed using 50% skim milk with 50% cow's milk, which is as good as the cow's milkyoghurt.

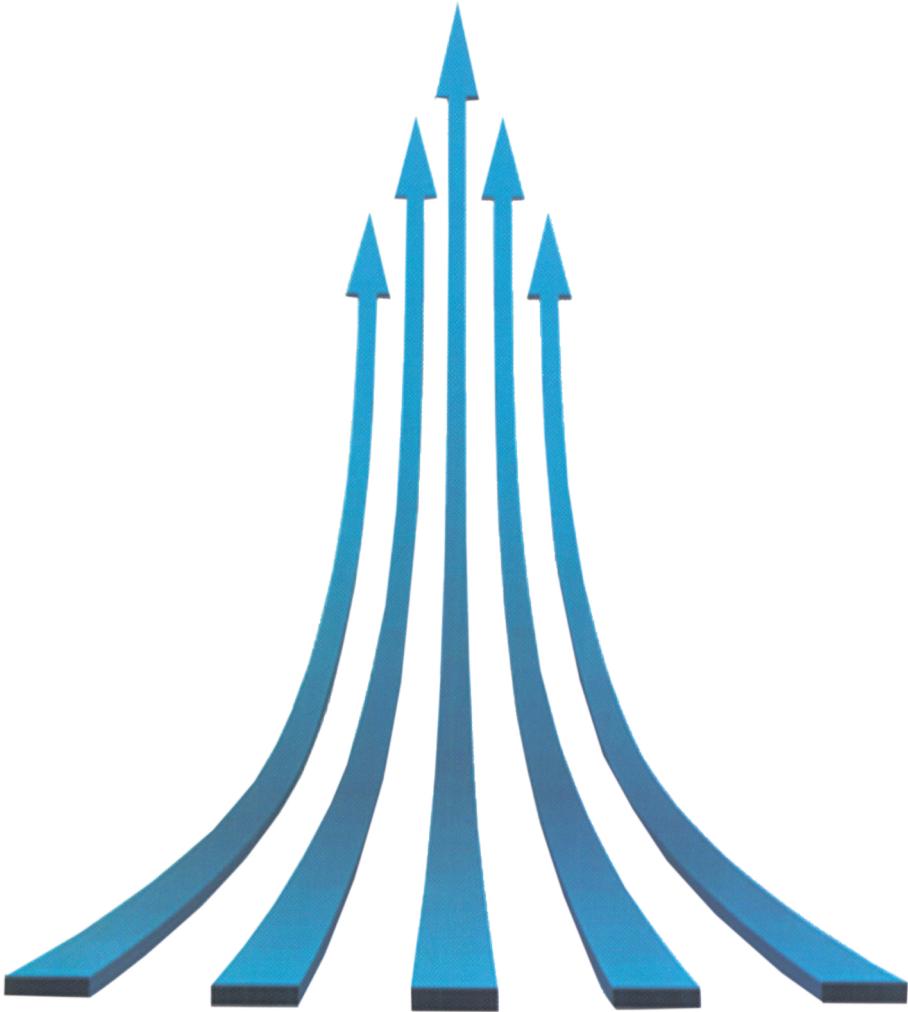
CRI strongly believes that R & D is the key for making coconut an economical crop in the worldwide market. Necessary policy changes and investment on R&D are suggested.

The current research programme of the Coconut Research Institute is discussed here in detail.



Dr. H.A. Jayantha Gunathilake
Director
Coconut Research Institute

Research Recommendations



Short term agroforestry to rehabilitate coconut cultivated soils

A new recommendation was developed to rehabilitate coconut cultivated soils prior to establishing a new plantation by growing leguminous trees, non-leguminous trees and grass species producing high biomass 05 years before re-planting.

Establish *Gliricidia sepium* (double row, 8ft x 3ft) with sunflower, *Tithonia diversifolia* (single row between gliricidia rows, 3' spacing) or grass, *Panicum maximum* (four rows, 1.5' x 1') with *Gliricidia sepium* (single row center of the coconut row, 3' spacing) between coconut rows alternatively. Lop all the plant species at the vegetative stage before flowering, lay green biomasses adjacent to coconut rows and incorporate with the soil by harrowing.

Agronomy Division

Vermicompost-based integrated fertilizer package for young coconut plantations

Vermicompost-based integrated fertilizer package was recommended to enhance growth of young coconut palms.

Apply vermin-compost produced from organic residues in coconut plantations, such as husks, leaves, stalks, livestock waste, poultry litter, dairy waste, weeds etc. along with inorganic fertilizer according to the schedule given below.

Ingredients	Basal	6 months	year 1	year 1.5	year 2	year 2.5	year 3	year 3.5	year 4
Vermi compost(kg)	12	6	8	8	12	12	15	15	20
Urea (g)	125	75	90	90	120	120	150	150	180
ERP (g)	375	170	200	200	270	270	340	340	405
MOP (g)	125	70	90	90	220	220	150	150	180
Dolomite (g)	1000	500	500	500	500	500	500	500	500

Agronomy Division

Coconut yoghurt

Coconut milk based yoghurt was recommended for the consumers looking for coconut flavor.

Coconut yoghurt is prepared using 50% cow's milk and 50% skim coconut milk. Skim coconut milk is obtained by adding water to defatted coconut residue in 3:1 proportion. The contents are heated at 80° C for 30 minutes followed by cooling to 60°C. Sugar (12 %) and gelatin (1 %) are added and heated to 93°C for 01 minute. The contents are cooled to 45°C and the fresh yoghurt culture (3%) is added. The mixture is filled into sterilized cups and is incubated at 45°C for 4 hours. The solidified yoghurt has 2 weeks shelf life at refrigerated conditions.

Coconut Processing Research Division

Policy Proposals



Improvements to coconut oil industry

Even though new coconut oil production process has been introduced traditional coconut oil industry has reached to a disadvantageous state due to production of low quality oil, which is not suitable for human consumption.

This is mainly due to use of low quality copra, which is contaminated with fungi that produce carcinogenic aflatoxin and use of parings, a by-product of desiccated coconut production for milling. The main reason for using such material is that copra processors could not offer a competitive price for coconuts due to very high volatility of coconut oil prices and copra prices because there is a time lag taken for copra processing process.

Therefore, following proposals are made to make the coconut oil industry profitable and viable.

- i. Impose strict regulations to maintain quality standards of coconut oil and to follow Good Management Practice (GMP) by all coconut oil mills through mill modernization program. To support modernization, it is recommended to provide finance with interest rebate facilities.
- ii. Market expansion through promotion of new products such as virgin coconut oil and oleo chemicals while adopting bottling and branding.
- iii. Provide facilities to analyze oil samples at a reasonable cost.
- iv. Develop technologies to reduce time taken for copra curing or direct expelling of coconut oil.

Agricultural Economics & Agribusiness Management Division



Research and Development **Highlights**



COCONUT VARIETAL IMPROVEMENT

Drought tolerant performance in Brown Dwarf crosses

Genetics & Plant Breeding Division

Different coconut hybrids were evaluated under moisture stress condition in a field experiment in Wanathawilluwa. These hybrids showed growth retardation leading to poor stem formation during early vegetative growth when subjected to severe moisture stress. Preliminary investigations showed that brown dwarf crosses were more tolerable to severe moisture stressed conditions than green dwarf crosses, brown dwarf crosses maintaining less than 35% palms below the site mean stem girth on average compared to 64% in green dwarf crosses. This indicated that brown dwarf crosses, Kapsuwaya and Kapsetha are more suitable for areas experiencing severe long dry spells.



Kapsuwaya palm at Wanathawillu field

Dwarf crosses for urban home gardens

Genetics & Plant Breeding Division

The evaluation of dwarf x dwarf coconut hybrid crosses produced aiming at urban home gardens in Sri Lanka was continued successfully. The trials established as observational blocks in 2010 and 2011 were maintained well and flowering data were recorded during the period. The site at Kobeigane was receiving a high level of management and hence the vegetative growth of all crosses there was found extraordinary compared to other sites. The percentage of flowering of D x D crosses, specially the red dwarf x brown dwarf and yellow dwarf x green dwarf, at both Kobeigane and Ambepussa was outstanding recording first flower initiation in less than 22 months compared to 27 months for pure yellow dwarf and 29 months for CRIC65 indicating a comparative superiority in flowering time in DxD crosses.



Dwarf X Dwarf hybrid plant

Production of new crosses with exotic pollen

Genetics & Plant Breeding Division

A new breeding programme was initiated in 2006 with pollen imported from Ivory Coast from three varieties, Rennel Island tall, Tagnanan tall and Malayan red dwarf. Several new crosses were developed with those exotic pollen and they were field evaluated for their performance under different agro-climatic conditions. Flowering of Sri Lanka Tall x Rennel Island Tall (SLT x RIT), a novel tall x tall cross developed by blending exotic genes into Sri Lanka tall coconut variety was remarkable with respect to time taken for first flower initiation and percentage flowering compared to other tall x tall crosses at all four sites. The percentage of flowering of SLT x RIT at Marandawila, Middeniya and Siringapatha were 10, 36 and 38 respectively compared to zero, 6 and 25 in CRIC60. At Middeniya and Sringapatha sites first flowering of SLT x RIT cross was observed to be happened in just two and half years after planting indicating that this cross is a highly promising tall x tall coconut hybrid for farmers.



Tall x Rennel Island Tall cross

Production of homozygous (pure lines) coconut through anther culture

Tissue Culture Division

Several experiments were focused on germination of anther-derived embryos. It was possible to convert embryos in to plantlets at a high rate when well-developed embryos were directly transferred to GA3 containing media. Preliminary experiments on microspore culture were undertaken as a measure of increasing the regeneration efficiency of dihaploid plants.



Developmental stages of anther derived embryos

Acclimatization of ovary derived clonal plants

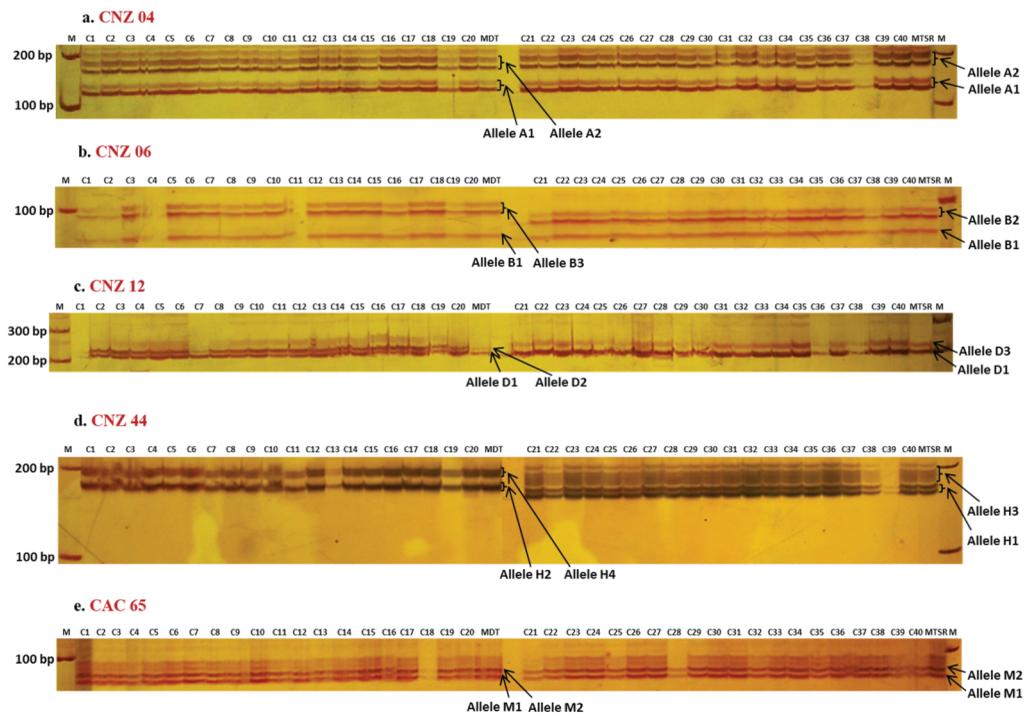
Tissue Culture Division

Five responsive palms (one CRIC65 and four CRISL98) were selected. Callus multiplication protocol was validated to achieve a satisfactory percentage of multiplication, which varied 5-50 times. Plant regeneration studies were continued. Shoots produced from 03 responsive palms (selected in 2011 and 2012) were maintained and acclimatized. Some are ready for field planting.

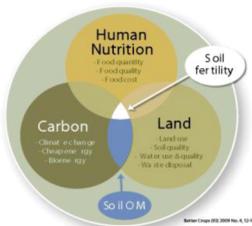
In order to determine the genetic homogeneity of coconut plantlets derived from unfertilized ovaries through somatic embryogenesis, 20 randomly selected plantlets at acclimatization stage, from 02

mother palms were subjected to SSR analysis. Ten SSR primer pairs were selected for the amplification of genomic DNA through PCR for the detection of genetic fidelity in the clonal plantlets and their respective parent, based on the previous genotypic information. These plantlets showed no apparent differences among themselves and were comparable with the

respective mother palm. The results obtained from this study suggest that there is no somaclonal variation or genetic instability occurring in plantlets that are regenerated from ovary explants which proved the suitability of regeneration protocol for large scale micro-propagation applications for coconut.



Amplified DNA profiles of SSR marker CNZ04 (up) and CNZ06 (down) of plantlets derived from unfertilized ovaries of 02 mother palms M: 100 bp Ladder DNA marker, MDT: DT-2 mother palm, MTRSR: TSR-12 mother palm, C1-C20 are clonal plants raised from DT-2 mother palm and C21- C40 are clonal plants raised from TSR-12 mother palm.



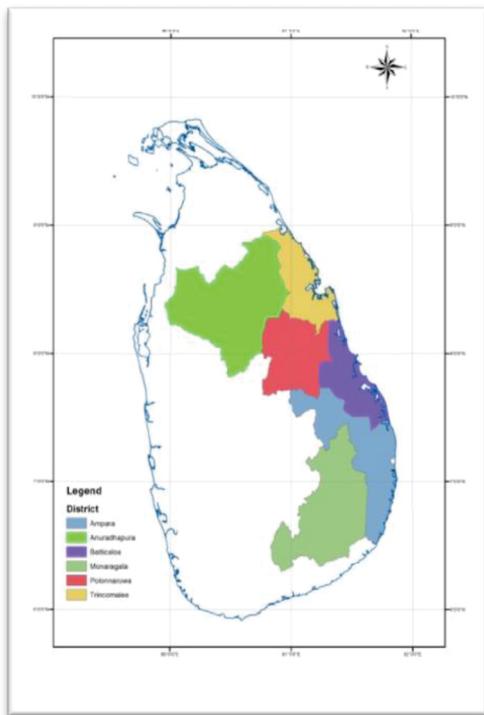
Soil fertility plays a crucial role in a truly sustainable food and agriculture system.

COCONUT PRODUCTION TECHNOLOGY

Land use classification for coconut cultivation in non-traditional areas of Sri Lanka

Soils & Plant Nutrition Division

Production of soil and land suitability maps in Ampara, Batticaloa and Trincomalee districts were completed.



Surveyed areas for soil and land suitability classification for coconut

Forty three soil maps (1:50,000) and 43 Land Suitability Maps (1:50,000) were produced covering Monaragala, Ampara, Trincomalee and Batticaloa districts.

Out of the total area of 376,160 ha. in the Monaragala district, 80% was identified as suitable for coconut cultivation. However, highly suitable (S1) lands with a potential yield of $>15,000$ nuts $\text{ha}^{-1}\text{yr}^{-1}$ was not identified. Suitable -Highly suitable (S2) lands with a potential yield of 12,500-15,000 nuts $\text{ha}^{-1}\text{yr}^{-1}$, suitable (S3) lands with a potential yield of 10,000-12,500 nuts $\text{ha}^{-1}\text{yr}^{-1}$, moderately suitable (S4) lands with potential yield of 5,000-10,000 nuts $\text{ha}^{-1}\text{yr}^{-1}$ and marginally suitable (S5) lands with potential yield of 2,500-5,000 nuts $\text{ha}^{-1}\text{yr}^{-1}$ were identified that cover 17,800ha, 90,500ha, 116,550ha and 21,600ha respectively. Sixteen 1:50,000 soil maps and land suitability maps of Moneragala are available at CRI.

District	No. of soil series	Great Soil Groups
Ampara	24	Regosols, Alluvial, Alluvial Colluvial, Low Humic Gley, Reddish Brown Earth and Non Calcic Brown
Batticaloa	23	Regosols, Alluvial, Alluvial Colluvial, Low Humic Gley, Reddish Brown Earth and Non Calcic Brown
Trincomalee	16	Regosols, Reddish Brown Earth and Non Calcic Brown

Boron deficiency in coconut

Soil & Plant Nutrition Division

Boron (B) is one of the essential micro nutrients for coconut. Boron deficiency results in a wide array of symptoms, which always occur on newly emerging leaves. Boron deficiency causes death of young coconut palms and affects the yield of bearing coconut palms. Boron deficiency symptoms are mainly observed in coconut grown in uprooted rubber lands. The survey on Boron availability in coconut triangle and coconut grown on uprooted rubber lands in Kalutara district revealed that about 25-30% were deficient in Boron.



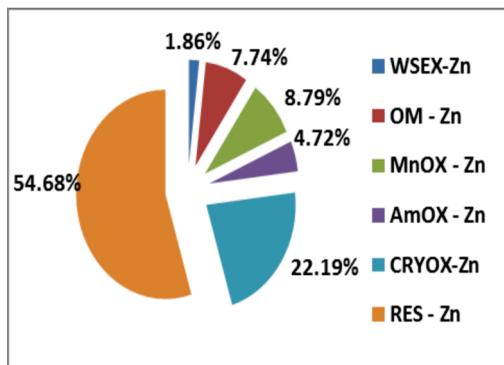
Boron deficiency symptoms in young palms

Distribution of Zn in coconut growing soils

Soil & Plant Nutrition Division

Sequential fractionation studies indicated that readily available pool of Zn (Water soluble + exchangeable - WSEX-Zn and Organically complexed - OM-Zn) was the least fraction and unavailable pool of Zn

(Manganese oxide bound – MnOX-Zn, Crystalline oxide bound – CRYOX-Zn and Residual – RES-Zn) was the dominant fraction. Readily available pool of Zn could be increased by decreasing pH and increasing organic carbon content in soil.



Different fractions of Zn out of total Zn in soil

Hidden deficiencies of Cu and Zn in coconut palms

Soils & Plant Nutrition Division

Copper (Cu) and Zinc (Zn) are essential micronutrients for growth, development and yield of coconut palms. Visual symptoms of Cu and Zn deficiencies have not being observed in coconut plantations. A study carried out to find out hidden deficiencies revealed that nearly 30% and 25% of coconut growing soils and 15% and 40% coconut palms are deficient in Cu and Zn, respectively.

Concentrations of CuSO_4 and ZnSO_4 spray solution tolerable to coconut seedlings

Soil & Plant Nutrition Division

The highest concentrations of CuSO_4 and ZnSO_4 that could be sprayed to increase leaf Cu and Zn levels to a maximum level without being toxic to the plant were investigated. The results revealed that the maximum CuSO_4 and ZnSO_4 concentrations that a seedling could tolerate are 200 ppm and 8%, respectively.



Symptoms of Copper toxicity

Most suitable leaf for sampling of Cu and Zn status in coconut seedlings

Soil & Plant Nutrition Division

By sampling different leaves of coconut seedlings sprayed with Cu and Zn solutions revealed that the 2nd youngest leaf was the most responsive leaf.



Spraying of copper sulphate solution

Evaluation on different fertilizer placement techniques

Soil & Plant Nutrition Division

The experiment was designed to evaluate three different fertilizer placement techniques; (a) trench method (0.5m away from the base of coconut palm, 0.33m wide, 10cm deep), (b) four pit method (0.33m x 0.33m pits equally distributed within the trench area of placement (a), and (c) basin method (1.7m radius from the ball outward) with inorganic, inorganic + organic separately over currently recommended surface application. The fertilizer placement technique of trench application with inorganic only has shown a significant increment ($p \leq 0.001$) in nut yield $\text{palm}^{-1} \text{ year}^{-1}$ over the currently recommended surface application of chemical fertilizer. Furthermore, all three fertilizer placement techniques with inorganic and (organic + inorganic) separately have shown 10-38% increase in nut yield $\text{palm}^{-1} \text{ year}^{-1}$ during the year 2014 over the surface application of inorganic fertilizer. Moreover, palms maintained sufficient levels of N, P, K, and Mg in all palms, according to the leaf analysis data.



Fertilizer placement technique

Amelioration of Boralu and Sudu series soils by adding organic manure

Soils & Plant Nutrition Division

Two types of organic sources; goat manure and Gliricidia fresh leaves were applied to determine the level of soil improvement.

Two levels of Gliricidia fresh leaves (75, 100kg palm⁻¹year⁻¹) and 03 levels (50, 75, 100 kg palm⁻¹ year⁻¹) of goat manure increased the nut yield significantly compared to inorganic fertilizer application in Sudu series soil. Also, 7-22% increase in nut yield was noted in all treatments with organic manure compared to palms treated with chemical fertilizer in Boralu soil series site.

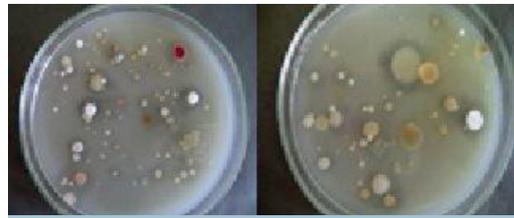


Application of Gliricidia fresh leaves

Residual effect of different phosphate fertilizers

Soils & Plant Nutrition Division

In the experiment to study the residual effect of different phosphate fertilizers at Ratmalagara Estate, the phosphate solubility bacteria (PSB) showed a positive correlation with soil available phosphorus ($R^2=0.923$) in the manure circle of coconut palms suggesting that PSB plays a vital role in phosphorus availability of soils. Five, 3 and 2 different bacterial cultures (by colony morphology) were isolated from Eppawela Rock Phosphate, control and the Triple Super Phosphate treatments. These PSB's have been identified to solubilize phosphates to a greater extent in-situ.



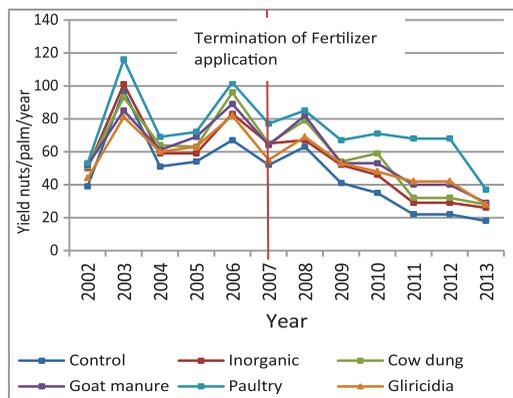
Phosphate solubilizing bacteria forming clear zone in Pikovskaya's Agar medium

Residual effect of applied organic manure and green manure (Gliricidia) against adult palm mixture (APM)

Soils & Plant Nutrition Division

The experiment to evaluate the residual effect of long-term application of organic manures; goat manure, cattle manure, poultry manure and a green manure (gliricidia) against adult palm mixture on the performance of coconut was completed. The manure and fertilizer application had been continued at recommended rates annually for 06 years before the evaluation of residual effect.

The treatment applied with poultry manure has given the highest yield compared to all other treatments right throughout the experiment, even after treatment application was terminated in 2008. The organic manure treated palms have maintained a higher yield than inorganic fertilizer applied treatment throughout the assessment period of residual effect.



Mean bulk density in the manure circle of the poultry manure treated soil was significantly lower compared to the other treatments. The lower bulk density indicates higher soil porosity facilitating better root growth. The highest bulk density was recorded in the manure circle of control palms. The results reveal that the organic manure application enhances soil condition resulting higher yield in a scenario of discontinued annual supply of nutrients.

Use of different plant species to rehabilitate coconut cultivated soils

Agronomy Division

After a prolonged period of monoculture under coconut, physico-chemical as well as biological properties of the soil deteriorate considerably resulting in low productivity of coconut plantations. Introduction of short term agro-forestry systems allows improving the soil environment. High biomass producing grass, *Panicum maximum*, leguminous species, *Pueraria phaseoloides* and non-leguminous trees and shrubs, *Gliricidia sepium* and *Tithonia diversifolia* were grown in the study. All the plant species were lopped and added to the soil. The highest biomass production was given by *G. sepium* followed by *G. sepium*+*T. diversifolia* and *P. maximum* + *G. sepium*. It was found that soil bulk density decreased by 11% -26%, soil moisture content increased by 69.4%-121%, soil microbial activity increased by 54.1%-92.8%, soil organic carbon status increased by 46.4%-77.1%, soil N and K status increased by 12% -72% and 31.5% -95.8% by introducing short term plants compared to the plots without any plant species after a six years period indicating that rehabilitation with different high biomass

producing grass species and leguminous and non-leguminous trees and shrubs improved soil health.



G. sepium + *P. maximum* mixture

A green manure based fertilizer mixture for organic coconut farming systems

Agronomy Division

Tithonia diversifolia has high potential as a green manure since it contains high concentrations of N, P and K in leaves. The biomass production of *T. diversifolia* is influenced by the establishment method, frequency of lopping, stand density and site conditions. The study initiated to develop a green manure based fertilizer mixture to replace urea and MOP requirements in organic coconut farming systems using *T. diversifolia* and *Gliricidia sepium*. Both plant species were established by different methods and their leaves were lopped and added to the coconut manure circle. The highest biomass was obtained from the mixture of *G. sepium* and *T. diversifolia*. Application of green manure increased the soil moisture content by 50%-110%, increased soil microbial activity by 25%-60.8% and increased soil organic carbon status by 32%-61% after 3 years of application. However, the treatments have not affected nut yield so far.



T. diversifolia planted between coconut rows

Different types of exotic bio-fertilizers on growth of coconut seedlings

Agronomy Division

MYCOgold and Bio-Organic aGricare produced by MALAYSIAN AGRI CARE SND. BHD., Malaysia is a bio fertilizer consisting of endo mycorrhizal fungi. These fungi are well known for improving nutrient and water uptake, enhancing root and plant growth and yield. A nursery experiment was conducted to evaluate MYCOgold on growth of nursery seedlings. Also, two field experiments were carried out to evaluate the effect of MYCOgold and aGricare on replanted coconut seedlings. MYCO gave a significantly increased number, volume and dry weight of primary, secondary, tertiary and quaternary roots and stem girth. Also, a significantly higher leaf production rate and stem girth was reported from two field experiments of using MYCOgold and aGricare.



Root growth in MYCOgold and aGricare treated and untreated seedlings

Effect of vermi-compost on growth of coconut seedlings

Agronomy Division

An experiment was established to evaluate the effect of vermi-compost on the growth of coconut seedlings. Vermicompost was applied to young plants from the time of planting up to flowering in different combinations with inorganic fertilizer. The highest seedling growth was observed in vermicompost+inorganic fertilizer treated seedlings compared with only vermi-compost and inorganic fertilizer applied seedlings indicating its ability to enhance soil fertility and improved coconut seedling growth.

Effect of vermi-compost and inorganic fertilizers on seedling girth and leaf production rate in 2012

Leaf production Treatment	Seedling girth (cm)		leaf production	
	June	Dec	June	Dec
T ₁ -Vermi-compost only	153 ^c	158 ^b	0.81 ^a	0.85 ^a
T ₂ -Inorganic fertilizer (YPM)	141 ^b	155 ^b	0.90 ^a	0.88 ^a
T ₃ -Vermi compost+Inorganic fertilizer (YPM)	160 ^a	169 ^a	1.08 ^b	1.02 ^b



CLIMATE CHANGE EFFECTS ON COCONUT PRODUCTION

Increased warming in major coconut growing areas

Plant Physiology Division

Continuously increasing warming trend was observed in both DL₃ and IL₁ agro-ecological regions. It was found that the probability of occurrence of extremely hot days is also increasing in both regions.

Effect of water and heat stress prior to on quality of flowers in hybrid seed nut production

Plant Physiology Division and Genetics & Plant Breeding Division

Fruit setting of coconut, particularly under artificial pollination conditions, is greatly affected by the effects of climate change. The effect of heat and drought stress during final stages of inflorescence

development on the carbohydrate content of female flowers in Dwarf Green and carbohydrate content and germination ability of pollen in Tall (SLT) and San Ramon (SR) varieties which are used in production of CRIC65 (DGxSLT) and Kapruwana (DGxSR) hybrids in Ambakelle (ISG) and Pallama (PSG) seed gardens was assessed. The intensity of heat (T_{max}) and water stress during final 04 months before inflorescence opening showed a significant negative effect on the quality of pollen and female flowers. (NRC 13-032 funded project)

Effect of climatic conditions on yield variation of coconut

Plant Physiology Division

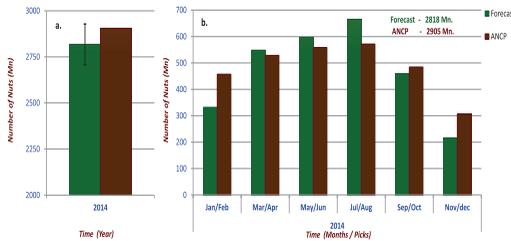
The Annual National Coconut Production (ANCP) was estimated using 700 coconut plantations distributed in all coconut growing districts. The forecast for the year 2014 and the estimated actual ANCP were impressively matching with only 3% difference with the new approach used for the prediction of coconut yield. This close matching was observed in both annual as well as bimonthly (pick wise) records. The ANCP was 2905 Mn nuts in 2014 and this is a 16% increase in yield compared to that of 2013 (2513 Mn nuts). Severe heat and drought stress prevailed in August-September 2012 reduced the crop yield significantly in 2013 and the palms have been recovered in 2014 giving a higher



Emasculation of Dwarf Green inflorescence

Successfully set nuts and aborted female flowers

yield. A short but high intense dry spell experienced by the most parts of the country during February to April of 2014 caused significant reductions in fruit set of the inflorescences opened during that period and consequently, significant reductions in coconut yield towards the end of 2014. This reduction will continue up to January 2015 in all major coconut growing areas.

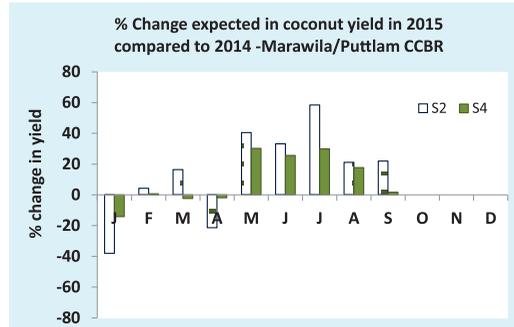
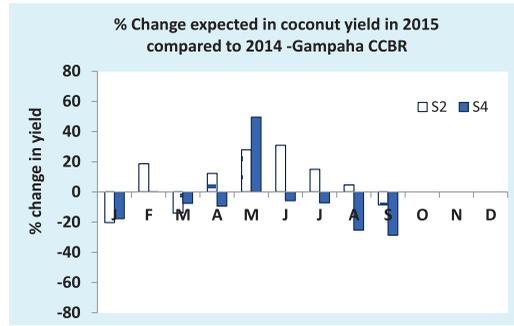
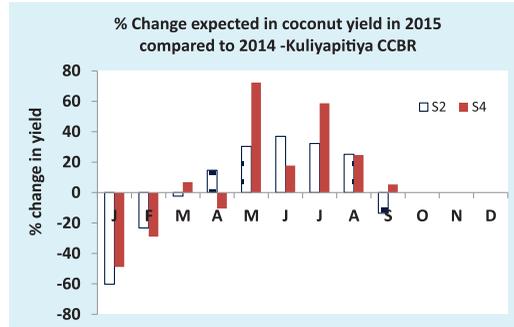
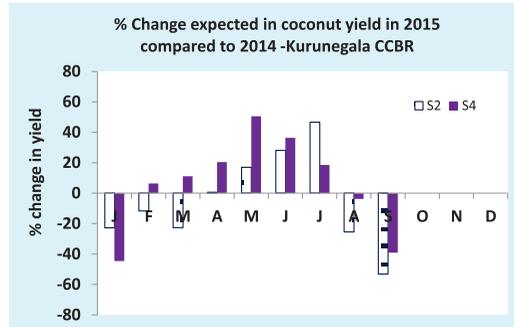


Comparison of forecast and the actual annual national coconut production on (a) yearly basis and (b) on bi-monthly basis for 2014

Forecast of coconut yield of 2015

Plant Physiology Division

The expected change in monthly yield in 2015 compared to 2014 was forecast for the main coconut growing areas; Kurunegala, Kuliyaipitiya, Gampaha and Puttalam CCB Regions based on the fruit set data and the rate of survival of set fruits. It clearly showed the reductions in yield in early parts of 2015 while the yield is in increasing trend towards the middle part of the year in all areas. There will be a yield reduction during August/ September 2015 compared to 2014 in main coconut growing areas, except Puttalam.



Monthly changes expected in coconut yield from January to September, 2015 in Kurunegala, Kuliyaipitiya, Gampaha and marawila CCB Regions (S₂-suitable soils, S₄-marginal soils)

Mixed cropping to change micro-climate of coconut plantations

Plant Physiology Division

Three coconut-based mixed cropping systems existing in the dry zone (Puttalam (DL₃) (coconut and cashew) and Anuradhapura (DL_{1b}) (coconut and guava, coconut and banana) were evaluated for their potential in changing micro-climatic condition and increasing reproductive survivability of coconut during drought periods. Coconut and banana mixed cropping system was more effective in reducing canopy level air temperature and soil temperature and increasing soil moisture content compared to monocrop and other mixed-cropping systems.



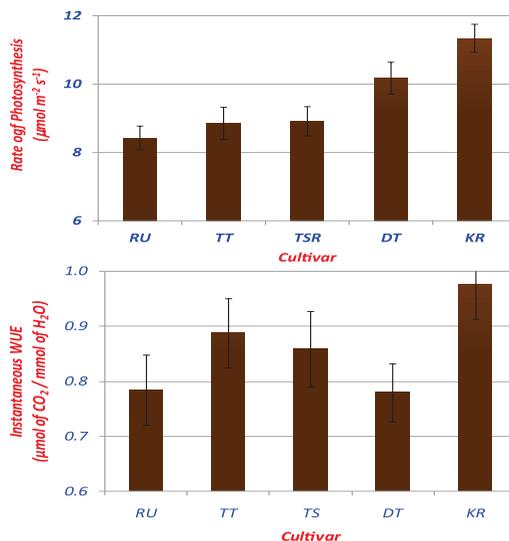
Coconut-Banana mixed cropping system

Physiological performance of coconut cultivars in coconut mini-triangle under soil moisture management

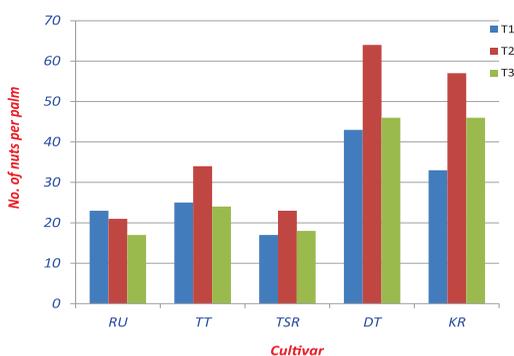
Plant Physiology Division

When Rumassala Tall (RU), TT, TSR, DGT and DGSR were grown in coconut-mini triangle, Middeniya where rain free dry spells are more frequent, more than 70% higher yields were observed in seven-year-old hybrids (DGT and DGSR) compared to the widely grown TT under integrated soil moisture management system. A positive net profit was recorded in the 5th year and thus a significant shortening of the payback period (national average of 20–21 years) is expected even in such a drought

prone area with this integrated soil moisture management system. One of the major reasons for this higher productivity of hybrids was their inherent nature of higher photosynthetic rates compared to tall cultivars. Moreover, out of the two hybrids, Kapruwana (DGSR) showed higher instantaneous water use efficiency which indicates the amount of production per unit of water lost as transpiration.



Rate of photosynthesis (above) and Instantaneous Water Use Efficiency (IWUE) (below) of five cultivars at Middeniya Research Centre



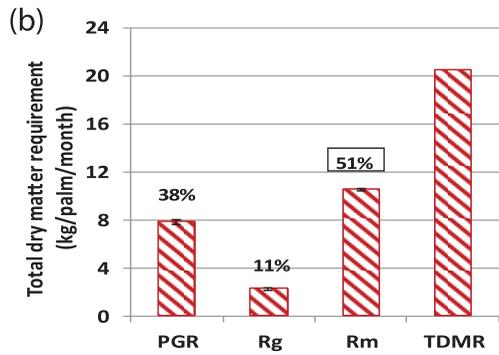
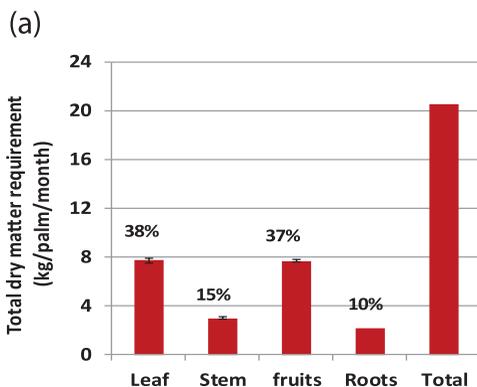
T1-Control
T2-Integrated Moisture Conservation
T3-Irrigation

Cumulative yield of coconut (nuts/ palm) of five cultivars twelve years after field planting at Middeniya Research Centre

Dry matter requirement of adult coconut (SLT) palms

Plant Physiology Division

The ratio between demand and supply of photo-assimilates for growth and respiration of a palm under different growth conditions is a significant factor controlling coconut yield and fruit components. A non-destructive method was developed to estimate the dry matter requirement of single fruits of 14 developing stages, using the relationship between length and the dry matter content of 'potentially growing (resource unlimited)' fruits of each stage. This model was used to estimate the dry matter requirement of each bunch in a palm (assimilate demand). The estimated total dry matter requirement (TDMR) of an adult SLT palm is about 21 kg/palm/month and nearly two-third of that is required for growth and respiration of vegetative organs (leaves, stem and roots, 63%) and only one-third (37%) of the total was required by fruits. Similarly, the DM required for growth (Rg) and maintenance respiration (Rm) is nearly two third (62%) of the total requirement and only 38% was required for growth of organs (PGR). This information can be used to quantify the yield fluctuations related to source / sink ratio of palms.

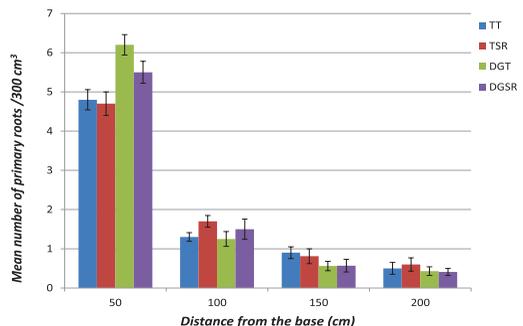


Total dry matter requirement of an adult coconut palm. (a) it's contribution by different organs and (b) its contribution by different processes

Root distribution pattern of young coconut palms

Plant Physiology Division

Investigations on the root distribution pattern of ten-year-old TT, DT, TSR and DGSR in wet, intermediate and dry zones revealed that intermittent dry spells occur in intermediate and dry zones had enhanced more root growth compared to that in wet zone. More than 90% of roots were limited to the 150 cm distance from the base of the palm irrespective of cultivar. Similarly, close to 90% roots were concentrated within the top most 80 cm depth even at the age of ten years irrespective of the cultivar and the climatic zone.



Variation of primary root number of five cultivars at different distances from the base of the palm



CROP PROTECTION

Identification of coconut mite tolerant/resistant varieties

Crop Protection Division

Identifying tolerant variety/varieties for coconut mite was continued. Data on damage incidence on 3-4 month old bunches, populations of coconut mite and its predator, *Neoseiulus baraki* and shape of the nuts were collected during wet and dry seasons using 13 parental materials and their hybrids. Percentage of palms with damaged nuts on 3-4 month old bunches was lowest in Ranthambili (<2%) followed by Gonthambili (5%) and Sri Lanka Yellow Dwarf (24%). Mean number of coconut mites per nut was also lowest on Ranthambili (<30), Gonthambili (156), Sri Lanka Yellow Dwarf and its hybrid with Sri Lanka Tall (380 and 386 respectively). It was also observed that both parameters are higher during dry season compared to the wet season, even on apparently tolerant varieties.



Sri Lanka Yellow dwarf (L) and Ranthambili (R), putative tolerant varieties for coconut mite

More roundish nuts, which make the nuts more resistant to colonization of coconut mites were observed in Gonthambili and Ranthambili. The highest predatory mite population was observed in Sri Lanka Green Dwarf.

Effectiveness of *T. brontispae* in the field

Crop Protection Division

The level of parasitism of the exotic parasitoid, *Tetrastichus brontispae* in the field was evaluated.



Release of *T. brontispae* parasitoids

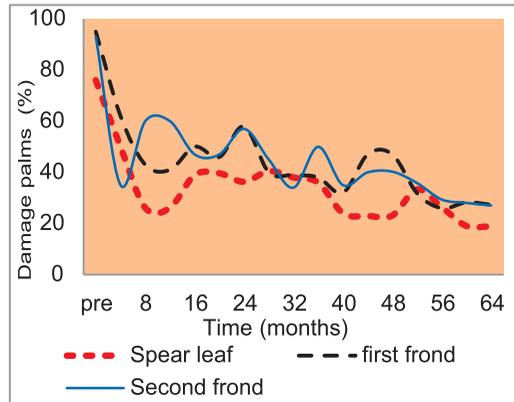
Twenty pre-infested coconut seedlings with 5 larvae/ seedling were used for this study. Three parasitized *Plesispa* pupae from which approximately 1000~1500 *T. brontispae* parasitoids would emerge within few days were placed in a vial and hung on a seedling. After five days, *Plesispa* pupae were collected from the seedlings and parasitism levels were determined. The study was repeated twice in dry and wet seasons. The level of parasitism was 5-10% in the dry season and 30-35% in wet season. It was observed that the level of parasitism was affected by the prevailing weather conditions.

Effectiveness of pheromone-baited traps for managing *Oryctes* beetle

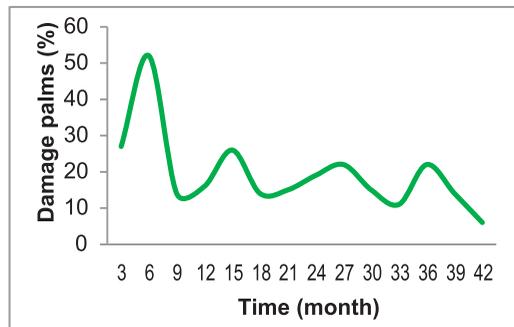
Crop Protection Division

The long term study of evaluating of pheromone-baited traps in reducing damage of black beetles was completed. The study conducted in two locations to represent severely (NLDB farm, Andigama) and moderately (Pahala Medagoda village) damaged plantations. Black beetle damage was reduced by 70% at Andigama and 26% at Pahala Medagoda over time. In the severely damaged site a total of 22,031 beetles were trapped in traps installed at 1 trap/ac. during the 04 years. In the moderately affected site traps were installed at 1 trap/5 ac. A total of 9534

beetles were trapped during the 04 year period. The study proved that use of pheromone-baited traps in severe and moderately affected sites at 1 trap/ac and 1 trap/5 ac respectively are effective in reducing the damage.



Percentage palms showing black beetle damage at Andigama with Pheromome troph



Percentage palms showing black beetle damage at Pahala Medagama with Pheromome troph



COCONUT PROCESSING & PRODUCT DEVELOPMENT

Health Benefits of coconut oil

Coconut Processing Research Division

A study was carried out to determine the health benefits of coconut products using healthy Wistar rat model. Six groups of rats were maintained up to 40 weeks on different diets. Each of 06 groupsof rats were fed with soya oil (control), white coconut oil, virgin coconut oil, refined bleached and de odorized coconut oil, white coconut oil+ grated coconut and virgin coconut oil+ grated coconut. Lipid profile, anti-oxidant activity, body weight and atherosclerotic changes were determined. Results showed a beneficial effect of VCO by lowering total cholesterol and increasing HDL. The coconut fibre also lowered the blood sugar and triglycerides in healthy Wistar rats. At 36 weeks (1year old), no adverse effects on blood parameters were seen in any group of rats.



Drawing of blood from a Wistar rat

Relationship between consumption pattern of coconut oil and cardiovascular mortality

University of Kelaniya & Coconut Processing Research Division

A hospital based case control study at the Colombo North Teaching Hospital (CNTH),

Ragama was conducted to determine the relationship between consumption pattern of coconut oil and incidence of cardiovascular mortality. The study population was comprised of newly diagnosed patients with Acute Coronary Syndrome and stroke presented at the CNTH and patients with no evidence of acute coronary syndrome or stroke admitted to the CNTH for other complaints as the control. According to the results, coconut oil consumption was lower among the cases (91.5%) than the controls (98%), but consumption of other vegetable oils was higher among cases (8.5%) than controls (2%).The number of cases and controls consuming coconut oil were substantially larger than those using other types of oil. There was no significant difference in coconut oil consumption between the two groups. The study concludes that as the coconut oil consumption levels are so high that there is no association between coconut oil consumption and incidence of cardiovascular disease.

Consumption pattern of coconut and attitudes of public in Kalutara district

University of Kelaniya & Coconut Processing Research Division

A study was carried out to identify the determinants of consumption of edible coconut products and its association with health among Sri Lankans. Results showed a significantly higher use of coconut/person/year in rural sector than estate and urban sectors (93.5, 78.8 and 71.6 nuts respectively). Also it revealed that

Sinhalese consumes more coconuts/year than Tamils and Moors (92.6, 73.5 and 65 nuts/year/person respectively).

Another study was conducted to describe knowledge, attitudes and practices in relation to consumption of edible coconut products and health among the public and healthcare workers in Kalutara District. In general they seemed to be confused because they were told conflicting pieces of advice by oil companies, doctors, and the media. Participants expressed that they were reluctant to use virgin coconut oil as they have worries that some harmful chemicals would have been used to convert the coconut oil colourless. Media advertisements imposed an influence on the choice of cooking oil.

Effect of different stabilizers on layer separation of coconut paste

Coconut Processing Research Division



Production of coconut paste

Coconut paste was developed to reduce wastage of coconut in the domestic coconut milk extraction process. The layer separation is observed during storage of coconut paste in ambient conditions. Several stabilizers were incorporated to the coconut paste to overcome the layer separation in order to increase the consumer attraction. Five percent defatted coconut flour (virgin coconut oil residue flour) was able to prevent layer separation of coconut paste partially. According to the sensory evaluation defatted coconut flour added paste scored similar to the coconut paste without defatted flour.

Comparison of copra drying methods on oil quality

Coconut Processing Research Division

Coconut oil is produced by drying fresh coconut kernel to make copra and milling the copra. Since the quality of oil depends on the method of copra produced a study was conducted to compare different methods of drying using coconut shell operated kiln, charcoal powder operated kiln and sundrying. Oil was expelled using a baby expeller. The moisture content of the oil produced from both charcoal powder operated kiln and shell operated kiln was 0.3%. Free fatty acid content of the oil produced from charcoal powder operated kiln and shell operated kiln was 0.1% and 0.32% respectively. The colour was less in the oil produced from charcoal operated kiln than that of other methods. It was concluded that oil produced from charcoal powder operated kiln was better in quality compared to shell operated kiln and sundrying.

Improvements to the production of Nata de coco

Coconut Processing Research Division

Culturing of *Acetobactor xylinum* in preparation of *Nata de coco* and vinegar, pineapple peel, tomato juice which is responsible for forming *Nata* were studied. Isolation and identification of *A. xylinum* was carried out using modified Hestrin and Schramm medium. The cultures were successfully utilized for making *nata de coco* and the protocol for preparation of culture and the *Nata de coco* were developed. Further improvements will be made before commercialization.



Production of Nata De Coco

A ready to serve coconut sap beverage

Coconut Processing Research Division

A study was carried out to develop a ready to serve, low cost beverage from coconut sap with increased shelf life and consumer acceptance. Sap mixed with water (30% concentration) gave a satisfactory combination for the beverage in the sensory evaluation. The same beverage with carbonation scored higher sensory acceptance. The product could be kept for 3 weeks. Further studies are underway to improve the product.

Also collection method was developed to collect unfermented sap for the preparation of pure coconut sugar and jaggery.



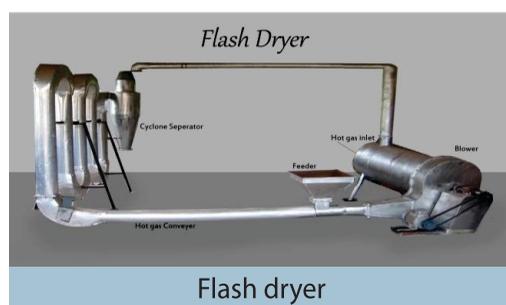
Sweet Toddy collection to produce a ready to serve coconut sap beverage

Reduction of microbial load of coir pith by flash drying

Coconut Processing Research Division

The effect of flash drying technique on reduction of microbial load was compared

with sun drying. Higher reduction in microbial load occurred with increasing temperature from 120°C to 160°C. This reduction was 89% and 99% at the end of 5th and 4th cycles with temperatures of 120°C and 140°C respectively. Rapid reduction of microbial load occurred at the initial steps of cycles at 140°C and 160°C compared to those at the lower temperature (120°C). In sun drying microbial load was 88% after 11h of drying.



Coir fiber reinforced cement composite board

Coconut Processing Research Division

A coir fiber based cement composite board was developed for ceiling panels as an alternative to asbestos sheets.

Coir fiber of app. 2cm long incorporated to a paste of cement and water (W/C 0.26) produced a composite board of 11MPa Flexural strength. The surface finish of the boards is improved by applying a pre coat (Glidden) and emulsion paint (Robbialac Xtra).



SOCIO-ECONOMICS

Overall sector performance of kernel, fiber and other products

Agricultural Economics & Agribusiness Management Division

The study in 2014 indicated that government continued tariff policies with minimal adjustments. Fresh nut exports were banned with the intention of diverting the nuts for processing industry and to fulfill the demand of the consumers, but according to the past experiences this policy will badly influence on export share for fresh nuts in the long run. The government import policy on edible oil contributed to improve the virgin coconut oil industry in Sri Lanka. Also, it was revealed that increase in export price of desiccated coconut contributed to continuation of stable prices for coconut, but still traditional coconut oil producers cannot compete with imported edible oil prices due to difficulty in purchasing nuts.



Socio-economic impact of Weligama Coconut Leaf Wilt Disease (WCLWD)

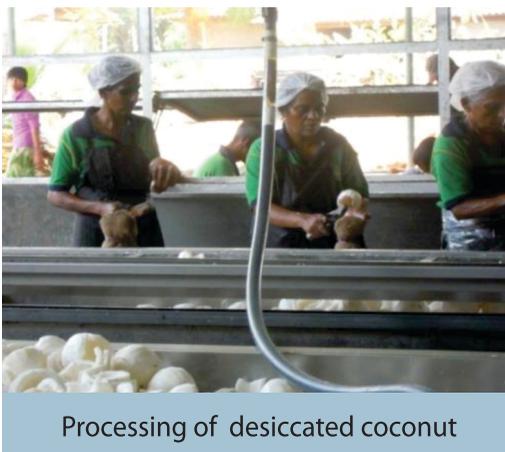
Agricultural Economics & Agribusiness Management Division

Data collection on the survey for 2014 was completed. WCLWD affected area covers 12% of the total coconut extent and around 12% population of the country is living in that area. Majority of the households use coconut for their own consumption. More than 33% of nuts produced in their lands are consumed by the households while only 50% of the respondents have the excess nuts for other uses. Average nut consumption per household is 54 nuts per month. According to the estimates around 378 million nuts are required for the consumption of the households in the affected districts. Study revealed that more than 88% of people have removed diseased palms while 99% of the people have received compensation. Growers who lost their coconut cultivation seek assistance either to grow coconut again or some other alternative crops. Results showed that only 10.6% of the growers have received some sort of assistance for alternative crops. The study results have not shown any influence on land value yet, because less number of palms has been removed from the individual estates.

Performance of coconut oil sector

Agricultural Economics & Agribusiness Management Division

Coconut oil industry uses copra and the pairing, a byproduct of desiccated coconut industry as raw material. Oil producers use an inefficient process of oil production, which has not been upgraded. Besides that no proper mechanism has been developed to adopt Sri Lankan quality standards for measuring the quality of coconut oil. Also, this industry uses low quality copra contaminated with fungus.



Processing of desiccated coconut

In this context a study was initiated to analyze the coconut oil industry of Sri Lanka paying special attention on coconut triangle. It was revealed that main reasons for poor quality copra are use of selected nuts for processing, lack of processing methods and the most importantly the

storage methods. Copra producers are not in a position to bid for quality nuts, hence badly influence the output prices of coconut oil. The study highlighted the necessity of developing new technologies to produce copra by reducing time taken for curing. Also, coconut oil samples collected from different oil mills showed a very high variation in quality. The study highlighted the necessity of modernizing mills with compulsory quality certification.

Cost of production of coconut (COP)

Agricultural Economics & Agribusiness Management Division

The differences in major cost components and variation of COP in different agro-climatic zones, land sizes, land suitability classes and levels of management in 2014 were identified. The main cost components were cost of fertilizer application, labour for weeding, agrochemicals and harvesting. An important observation was the increase of cost of production in 2014 due to increase of raw material cost, especially labour and transportation even though fertilizer prices were remained unchanged. In general, the average COP of coconuts in the coconut triangle was Rs. 12.40 per nut. Cost of production of a nut in land suitability classes S1-S2, S3, S4, S5 are Rs. 7.50, Rs. 10.70, Rs. 11.70, Rs.14.50 and Rs. 17.70 respectively.

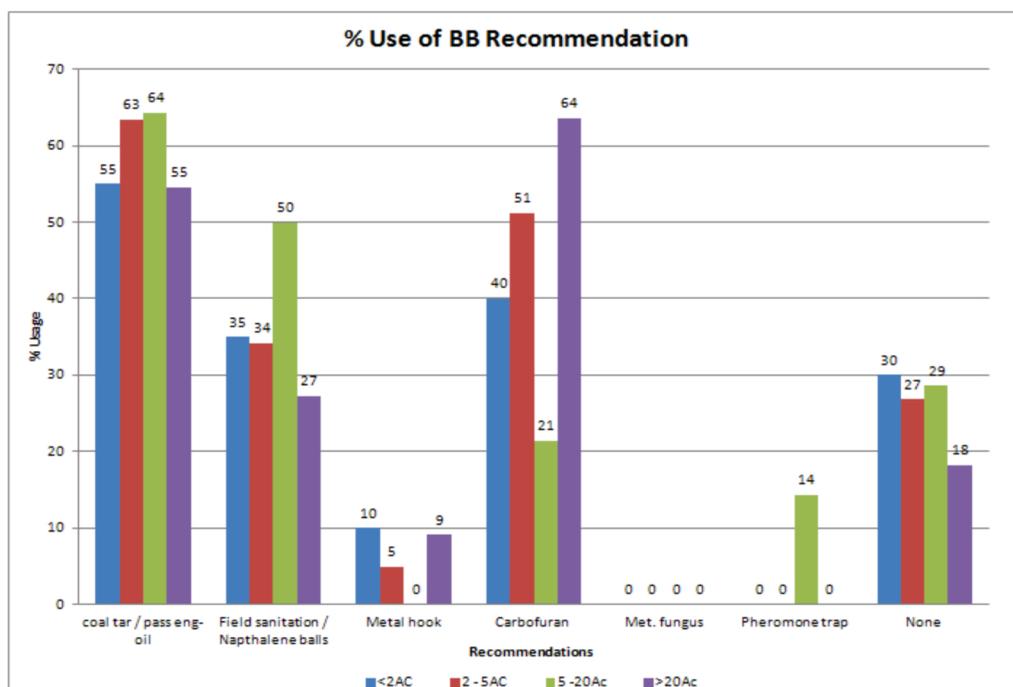
Analysis of adoption levels of technologies recommended for the management of major coconut pests

Technology Transfer Division

Although CRI has introduced proven technologies to manage pest damages, still a large number of pest incidences are reported due to lack of awareness of the recommended technologies and confidence on them. A study was undertaken to identify the factors affecting the adoption levels of technologies recommended for the management of major coconut pests in different land categories. The variables tested were age, gender and education level of the farmer, access to technology introduced by CRI, technology used, land extent, revenue from coconut and labour availability. Data was collected from different land categories; <2Ac, 2-5Ac, 5-20Ac, >20Ac in Kurunegala

district. Information was gathered by visiting the randomly selected farmer fields and by direct interview with the farmers.

According to the data collected, it showed that application of recommended technologies for all pest spp. were higher in land extent classes above 2Ac. As well as, farmers were easily control black beetle and plesispa beetle from their fields after using prevention methods/ control methods or both together. And also they control pests of black beetle, plesispa beetle, red weevil and mite using CRI recommended technologies as 70.83%, 56.36%, 23.91% and 23.47% respectively. Finally, the research study emphasized that unawareness of recommended technologies and paying very low attention for coconut farming are the major reasons for not adopting the CRI technologies.



Percentage usage of Black Beetle (BB) recommendation by farmers

Farmer acceptance of CRISL98 hybrid

Technology Transfer Division

The coconut hybrid, CRISL98 was released in 1998. Every year nearly 30,000 seedlings are issued to growers for field planting. The study was undertaken to identify the characters of CRISL98 that affects the acceptability of farmers, level of acceptance by the growers, socioeconomic characters affecting the acceptability of the hybrid and assess field management conditions in terms of yield and growth performance.

The preliminary data collected showed that acceptance of CRISL98 was based on acceptability of farmers and level of acceptance of the CRISL98, which include high yield, pest resistance, disease resistance, drought resistance, larger nuts, copra yield, kernel thickness, fiber content, timber value and the grower's socioeconomic characteristics which include ; age of the farmer, level of the education, size of the land and gender. The main contributor to the acceptance of CRISL98 was the characteristics of the CRISL98. In the farm level the average yield was app. 4600 nuts/ac./year.



CRISL98 palm

Identification of the training needs of coconut growers

Technology Transfer Division

During the last two decades the coconut growers have been facing many problems, which have ultimately resulted in a decline of their production and profits. In most cases, there is a gap between the knowledge of the farmers and that they should have to make good decisions. Training programs can play a crucial role in technology adoption decisions, providing farmers with the technical knowledge necessary for the selection of appropriate crop management practices. The aims of this study were to explore coconut growers' knowledge level and adoption level of coconut management practices and to identify and prioritize training needs. The growers were evaluated based on four aspects namely; planting, fertilizer application, agronomy and pest management practices. About 80% of data has been collected from the Kurunegala, Puttalam and Gampaha districts.

Results revealed that the growers in all the areas are knowledgeable in all practices, except pest management. As far as training needs are concern, there is a high need of a training program related to pest management practices for the growers in three districts.



Training Program for coconut growers

Possibility of reducing fertilizer subsidy by enhancing other influential factors

Technology Transfer Division

According to the findings of the diagnostic survey of 2005, the knowledge of farmers on fertilizer mixtures was very unsatisfactory level and 31% of growers have never applied fertilizer to coconut. Considering the low level of adopting fertilizer application the government launched a subsidy programme to all coconut growers in the country subsidy. In addition the price of fertilizer there may be other factors that influence fertilizer application.

Initial part of this study identified salient beliefs in fertilizer application. The beliefs were categorized into 03; behavioral, normative and control.

Behavioral beliefs of fertilizer application are yield increase, income increase, vigorous growth, sustainable yield, reduces pest and disease damages, increase yields of intercrops, reduce immature nut felling,

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Behavioral beliefs of fertilizer application are yield increase, income increase, vigorous growth, sustainable yield, reduces pest and disease damages, increase yields of intercrops, reduce immature nut felling, increase nut weight, palm get adopted to continues fertilizer application, increase the maintenance cost, cause environmental pollution, cause diseases to humans, increase growth of weeds and degrade soil.

Normative beliefs are; members of the family, CDO, neighbor grower, fertilizer shopkeeper, coconut pluckers and buyers, CRI & CCB training programmes and leaflets and booklets.

Control beliefs are lack of technical knowledge, availability of fertilizer, labor scarcity, affordability, farm gate price for coconuts, high labor wages, no suitable time to apply fertilizer due to climate change, no interest, no nutrient deficiency symptoms, no trust on fertilizer mixtures, no time to involve, no money, no credit facilities and fluctuation of coconut fertilizer prices.

OIL PALM RESEARCH & DEVELOPMENT



Land suitability assessment for oil palm cultivation

Oil Palm Research Division

Three sites were established in Bandirippuwa (IWL), Maduruoya (DL) and Pottukulama Estates (IDZ) to evaluate the suitability for oil palm cultivation in different areas. At the end of 2014, 47% and 67% palms in Bandirippuwa and Maduruoya reached flowering respectively. Also, in Bandirippuwa 67% palms and in Maduruoya 40% palms produced female bunches. *Eleudobius camerunicus* an important pollinating agent was also present in both sites.

Yielding patterns of oil palm

Oil Palm Research Division

The data collected from several estates of the southern region showed a peak production of FFB during months of May-July while the lean period was from December-January. This production pattern varied with rainfall prevailed during the year, age of palms. High genetic variation have been observed on per palm yield, size of bunches, size of seeds, and other kernel parts of seeds among the same population of palms.



Oil Palm plantation

Micro propagation of oil palm

Tissue Culture Division

The explant type and maturity stage are known to be crucial for callogenesis of oil palm. Amongst the two explants tested for callogenesis, leaf explants performed better than the ovary explant. In order to determine the effective medium for callogenesis, five media compositions were tested for callus initiation. Explants cultured on all five media produced calli and the percentage callus production was ranged between 5 – 7%. Callus multiplication protocol was applied to increase the callus yield. However, very low success rate (less than 5%) was observed. Calli produced from one responsive palm were subcultured to produce somatic embryos and continued for plant regeneration.



Immature leaf derived callus (left) and initiation of somatic embryos (right)

Physiological performance of oil palm seedlings in different agro-climatic zones

Plant Physiology Division



Oil Palm plantation

Evaluation of the physiological performance of two-year-old oil palm seedlings in the wet, intermediate and dry zones indicated that the rate of transpiration was lower and stomatal resistance to water flow was higher in the intermediate and dry zones compared to wet zone whilst, the rate of photosynthesis did not differ among three zones under favourable climatic conditions. There was an

appreciable decline in the growth parameters of the seedlings in the dry zone compared to that in the wet and intermediate zones.

Leaf Physiological parameters

Parameter	WZ	IZ	DZ
Tr	16.8 ± 0.3	7.9 ± 0.2	5.5 ± 0.4
rs	0.4 ± 0.01	1.5 ± 0.1	2.2 ± 0.2
Pn	10.8 ± 0.4	8.9 ± 0.4	11.6 ± 0.7
LA	2.6 ± 0.2	2.0 ± 0.2	1.4 ± 0.1
FN	31 ± 1.0	21 ± 0.8	17 ± 0.8
LAI	1.1 ± 0.1	0.6 ± 0.1	0.3 ± 0.03

Tr:-Transpiration

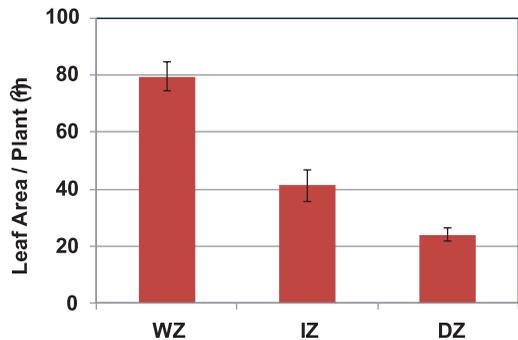
rs:-stomatal resistance

Pn:-Rate of photosynthesis

LA:- Leaf Area

FN : Frond Number

LAI : Leaf Area Index



Total leaf area/plant (m²) of two year old oil palm seedlings in the wet (WZ), Intermediate (IZ), and dry zones (DZ)



RESEARCH DEVELOPMENTS

Establishment of Kinyama Seed Garden

Genetics & Plant Breeding Division



View of the Kinyama Seed Garden in 2014

Establishment of the isolated seed garden at Kinyama Estate, Bingiriya, a joint venture between CRI and Chilaw Plantation Ltd, which was started in January 2012 was completed with the planting of a total of 5,554 Dwarf Green and 5,432 San Ramon seedlings. Nearly 10% of the plants had come to flowering by end of 2014.

Hybrid seed production and certification

Genetics & Plant Breeding Division



Flowers emasculated for production of CRIC65 hybrid seeds

During the year a total of 1,314,680 and 119,543 CRIC60 and CRIC65 seed nuts were produced from the three seed gardens respectively. Further, 36,352 CRISL98, 7,931 Kapruwana, 1,034 Kapsetha and 8,892 Kapsuwaya improved seeds were produced by the hand pollination programme. CRI assisted the Coconut Cultivation Board by selecting of 6379 Plus Palms for seed nut production.

Under the seedling certification program, 36,852 seedlings were certified by the staff of the Seed and Seedling Certification Unit.

Field planting of Weligama Coconut Leaf Wilt Disease tolerant hybrid seedlings

Genetics & Plant Breeding Division

Two coconut hybrids which were bred in the Southern Province expecting

resistance or tolerance to WCLWD were planted in the field for the first time in the year 2014. Accordingly, two experimental sites were planted at Mallikawatta, Sulthanagoda and later at Rubberwatta, in Kotawila. Altogether 200 seedlings were planted at the two sites to assess their performance in the fields where the diseased plants have been previously uprooted.



Raising of hybrid seedlings at Weligama nursery

Maintenance of buffer zone and check points for managing Weligama Coconut Leaf Wilt Disease

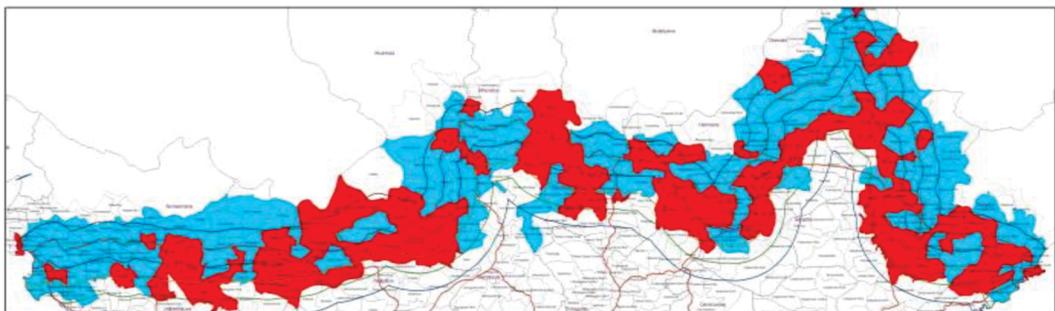
Crop Protection Division

Eighty six kilometer long and 3 km wide buffer zone surrounding the Weligama Coconut Leaf Wilt Disease area was monitored by land to land inspection, marking and removal of diseased palms to prevent advancement of the disease towards unaffected area. A total of 27311 lands in the buffer zone were inspected and 839 diseased palms have been found in 348 lands. A total of 828 palms were removed during the year.

A surveillance programme was initiated to investigate whether WCLWD has moved into un-affected areas adjacent to the boundary zone. Surveillance in a 5km wide strip immediately adjacent to the outer boundary of the buffer zone was started and a 2 km strip was completed during the year. Few scatted incidences of disease palms were reported in the first 1 km outside the buffer zone.

Three check points at Walasmulla, Ginthota and Akuressa were functioned to apprehend transportation of prohibited items. A total of 5200 vehicles were checked and have apprehended 1798 prohibited items.

Eighteen awareness programs were carried out in outside the boundary areas to create awareness among general public in surrounding area.



Diseased areas (red) in the buffer zone

■ Disease Incidence in Second Round
■ No Disease Incidence in Second Round

Demonstrations of farming systems

Agronomy Division

a. Livestock integration



Goat farming unit at Rathmalagara Research Center

The program for developing goat and buffalo farming systems under coconut with the objective of increasing profitability of small holder farmers through live stock integration under coconut was continued. Goat breeding program and demonstration at Ratmalagara was also continued with successful progress. During the year 10 male and female goats were sold to farmers to improve herds in their estates. Sheep farming is a very effective method to control weeds and improve soil fertility level in coconut lands. To develop and popularize sheep farming in coconut plantations, one field demonstration was established in Ratmalagara estate with active participation of famers. To upgrade the knowledge and awareness of local community, coconut growers and university, agriculture and school students on livestock management in coconut lands, two field pasture and fodder demonstrations containing fodder, pasture

and cover crops were continued in Ratmalagara and Bandirippuwa estates. Large number of students and farmers benefited through these demonstrations.

Three field demonstration blocks with inter cropping including export agricultural, fruit, timber, fodder and tuber crops were maintained at Makandura, Rathmalagara and Bandirippuwa Research Centers.

b. Bioenergy Production

Bio-energy generation was studied in a model designed in one hectare of coconut lands comprised with 150 coconut palms, 2500 trees of gliricidia, paddy straw supplied externally fed to six buffaloes in Ratmalagara. In this system gliricidia wood was used for gasification and buffalo dung was used to generate bio-gas.



Pasture museum



Intercropping demonstrations at Makandura Research Station



Bio energy generation at Rathmalagara Research Center

Planting gliricidia for production of wood fuel and foliage biomass

Agronomy Division

A demonstration project on development of a dedicated energy plantation of gliricidia under coconut at Pallama was continued to encourage coconut growers

for fuel wood farming on commercial scale. Total number of plants in the block was 30,000. No inputs such as fertilizer were added and the plantation was maintained under rain fed conditions. The total harvest of wood was 68,830kg and it earned an income of Rs. 256,765.00.



Gliricidia plantation at Pallama
Genetic Resource Centre

Maintenance of a database on coconut growers

*Agricultural Economics & Agribusiness
Management Division*

Development of a data base on coconut lands in all coconut growing districts was initiated. As the first step information were collected from the main coconut growing areas. With the help of Agrarian Services Department, information on main coconut growing districts was collected. Around 80% collected information of coconut growers were computerized. Separate comprehensive database on coconut statistics are being maintained in the division.

c. Vermicompost production

Agronomy Division

Two vermi-compost production units were established to multiply worms, *Eiseinia foetida* (tiger worm), *Eudrilus eugeniae* (African nightcrawler), *Perionyx excavatus* (compost worm) and *Lampitoma mauritti*. Worms were distributed among 50 coconut growers and two farmers have started to produce vermi-compost at commercial level. These units were also used as demonstration for farmers, university, school and agriculture students



Vermicomposting unit at Rathmalagara
Research Center and
worms used for composting (middle)

Technology Transfer Activities

Technology Transfer Division

Training Programmes

a. One-day training programme

One day educational programme series was conducted by the Institute to upgrade

the technical knowledge of the coconut growers. The programme series included seven one-day programmes on specific subject areas on coconut cultivation and management estates. The details of the programmes are shown in the table given below.

Date	Venue	Topic	Participants
30 May	ISG, Ambakele	Replanting of coconut	220
27 June	Ratmalagara	Soil and moisture conservation	191
25 July	Head Office, CRI	Fertilizer recommendations	119
29 August	Makandura	Intercropping / animal keeping	121
26 September	Head Office, CRI	Pest and diseases of coconut	105
31 October	Ratmalagara	Rehabilitation of coconut lands	135
05 December	Head Office, CRI	Labor law and estate management	96



a. Training programme on value added coconut products

During the year, twenty seven training programmes were conducted jointly with Coconut Cultivation Board for the Kapruka Society leaders and members covering various parts of the country. A total of 1598 participated.





2. School and university educational programme

During the year school educational programs were conducted at the institute for 2045 students and teachers from 23 schools. Also the division provided necessary guidance for 28 GCE O/L and A/L student projects on coconut related fields. Further, two teacher training programme were conducted for teachers of Negombo and Chilaw educational zones. Moreover, 15 practical training programs were conducted for students from universities and higher educational institutions.



3. Exhibitions

The division participated in 06 public and agricultural exhibitions to promote cultivation and processing technologies. The stall presented by the Ministry of Coconut Development and Janatha Estate Development including technologies of CRI won the first place in the “Deyata Kirula” exhibition held at Kuliyaipitiya.



4. Participatory grower training programmes

Two Farmer Field Schools were conducted for Kapruka Purawara society leaders in Meepitiya area in Kegalle. Further, two Crop Clinics were conducted at Wariyapola and Dompe.



5. Other training programmes

Twenty five familiarization programmes for foreign visitors from various countries, six programs of training of trainers (TOT) and one research Extension Dialogue was conducted to upgrade the technical knowledge of CDOOs in Kaluthara, Ratnapura, Gampaha and Matale coconut growing areas.

6. Technology dissemination through mass media

Twelve newspaper articles were published in Kapruka Magazine distribute with Dinamina, Dailynews and Thinakaran Papers. These articles cover many aspects of coconut cultivation and value added coconut products.

7. Printing and publications

Among the scheduled publications, 4 CRI Newsletters, "One Day Educational book series" - 7 booklets, CRI Guide Book, "Apen Obata" (CRI Services booklet), Leaflet & Poster for Weligama Wilt Disease were printed and issued. In addition, the printing unit of the division undertook more than 150 printing jobs for other divisions. This includes letters, survey forms, booklets, questionnaires, official forms, circulars and handouts.



8. Coconut Technology Park (CTP)

Coconut Technology Park (CTP) at Bandirippuwa estate maintained by the division became a major attraction for coconut growers, school children and the general public. During the year, CTP received 29,274 coconut growers and visitors.

Annual Income summary of the CTP

Type	Amount (Rs.)
Polybagged seedlings	495,250.00
Different products	480,767.00
From Technology Park	550,121.00
From others	255,769.00
Books /Publications	36,580.00
Miscellaneous	1,818,487.00
Total	





Coconut Technology park at Bandirippuwa Estate

CONTRIBUTION TO NATIONAL
DEVELOPMENT THROUGH
SERVICES TO STAKEHOLDERS



1. Differential Fertilizer Recommendation to Coconut Estates

Soils & Plant Nutrition Division



Leaf sample analysis for DFR

Differential Fertilizer Recommendation (DFR) for coconut is recommended based on variation of nutrient status of the coconut palm. A nominal fee is charged only to cover cost of chemicals. Estate owners are required to provide transport for officers visiting the land for leaf sampling. During the year 85 reports were issued which covered an extent of 2,063 ha extent.

2. Land suitability assessment for coconut lands

Soils & Plant Nutrition Division

Soil survey and land suitability assessments of coconut lands were undertaken. In this service, CRI recommends whether the land is suitable or not for coconut cultivation and forecast the potential nut yield according the suitability class of the land. A total 48 land suitability assessment reports were issued covering an area of 288 ha.



Land suitability map

3. Supply of parasitoids for the control of coconut caterpillar

Crop Protection Division

Coconut caterpillar infestations were reported from Gampaha, Kurunegala, Puttalam, Hambantota, Batticaloa and Ratnapura districts. CRI insectary bred 85,400 *Brachymeria nephantidis*, 574,500 *Bracon hebetor*, 110,200 *Goniozus nephantidis* and 60,000 *Trichospilus pupivora* parasitoids and released during the year.



Parasitized corcyra larva and pupa

4. Synthesis and supply of aggregation pheromone for mass trapping of red weevil

Crop Protection Division

Seven hundred and fifty milliliters of pheromone was synthesized in the laboratory of Crop Protection Division. A total of 7,201 pheromone vials were sold to the Coconut Cultivation Board and growers for trapping of red weevil adults. Two thousand of above vials were used by CCB in their special programmes which involved mass trapping of red weevils in a whole village.

Aggregation pheromone of black beetle was imported from India on the request of growers. Four thousand pheromone vials were sold to CCB for distribution among growers.



Red weevil pheromone vials

5. Production of predatory mites for the control of coconut mite

Crop Protection Division

Crop Protection Division of CRI continued to maintain 3 predator mite breeding laboratories which are situated at Bandirippuwa estate, Genetic Resource Center Ambakelle and Makandura Research Stations. A total of 33,203 predatory mite sachets were sold to growers to apply for 2,075 acres of coconut mite infested lands. Crop Protection Division provided technical guidance to maintain predator breeding laboratories

of Coconut Cultivation Board, Chilaw Plantations Ltd., Kurunegala Plantations Ltd. and private companies.



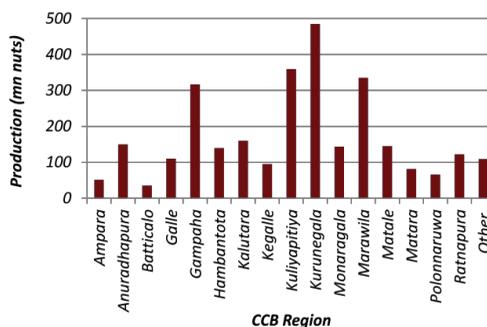
Preparation of predatory mite sachets

6. Estimation of national yield of 2013 and prediction of national yield in 2014

Biometry Unit, Plant Physiology and Agricultural Economics & Agribusiness Management Divisions

The estimated national coconut production in 2013 was 2,641 Mn nuts. It is about 10% reduction compared to the 2012 production, 2,940 Mn.

The predicted coconut production for the first six months (January-June) of 2014 is 1,567 Mn nuts; which ranged from 1,475 to a maximum of 1,661 Mn nuts.



Estimated coconut production in different CCB regions in 2014

7. Supply of meteorological data

Plant Physiology Division

Daily data of rainfall, air and soil temperature, relative humidity, wind velocity and sunshine hours of four research stations of CRI; BE, RE, ISG and MOSG were provided to the national database at the Meteorology Department. Monthly rainfall and temperature data were provided to growers, industry personnel, scientists and students and Divisional Secretariats of Wennappuwa, Mahawewa, Madampe and Dankotuwa, on their request.



Meteorology Station at Coconut Research Institute Bandirippuwa Estate

8. Supply of information to other institutions and stakeholders

Agricultural Economics & Agribusiness Management Division

1. Provided information to update research database of Council for Research Policy.
2. Provided coconut statistics to Central Bank of Sri Lanka, Sri Lanka Treasury and many other institutes and stakeholders.
3. Provided valuation reports to value coconut trees removed for different purposes.
4. Assisted to plan the fiber processing operation of Dunkannawa Fiber Research substation and proposed the incentive scheme for the workers.

9. Importation of oil palm seeds

Oil Palm Research Division

Assistance was given for RPC's to import pre-heated oil palm seeds from Indonesia, Malaysia and Thailand. Further, nurseries were continuously monitored collaboratively with the National Plant Quarantine Service.

10. Test Reports

Several test reports on coconut inputs and coconut based products were supplied on request

Division	Sample Type/ Division	No. of Samples Analysed
<i>Soils & Plant Nutrition Division</i>	Soil analysis for nutrient status	173
	Leaf analysis for nutrient status	302
	Analysis of Inorganic fertilizer for quality assurance	503
	Analysis of organic fertilizer for quality and to recommend organic manure package	161
	Coir pith sample analysis for quality assurance	430
	Water analysis for suitability for irrigation	31
<i>Coconut Processing Research Division</i>	Virgin coconut oil for free fatty acids and moisture content	578
	Coconut oil for FFA and moisture content)	28



INTERNATIONAL AND LOCAL RESEARCH COLLABORATIONS

International collaborations

CRI scientists to assist coconut development in Tanzania



A memorandum of understanding (MOU) to assist Tanzania in coconut development was signed between the government of Sri Lanka and the United Republic of Tanzania at the Ministry of External Affairs, Colombo on 21st July 2014. Hon. Jagath Pushpakumara, Minister of Coconut Development and Janatha Estate Development signed the MOU on behalf of the government of Sri Lanka and Hon. Bernard K. Membe, Foreign Minister of Tanzania signed on behalf of the United Republic of Tanzania. A team of experts from the Coconut Research Institute visited Tanzania and Zanzibar Islands and submitted a report embodying several proposals for the revival of Tanzania's coconut industry. The report has made several recommendations which included; collaborative research on development of coconut varieties resistant/tolerant to LYD, improved management of plantations, a

vigorous extension programme for the smallholder growers, search for bio agents to control white fly and coconut mite, technical assistance in selecting coconut processing equipment and establishment of pilot plants/demonstrations on coconut product development. Specific proposals for immediate implementation were the training of plantation managers / smallholders in integrated pest and nutrient management, developing extension materials and technical guides on pest control, farming systems research and product development.

The Coconut Research Institute, Sri Lanka and the Mikocheni Agricultural Research Institute, Da Salam, Tanzania will implement the provisions of this MOU on a time frame of three years

Sri Lanka hosted the XLVI COCOTECH conference and coconut festival

Asian and Pacific Coconut Community (APCC) sponsored the XLVI biennial conference to update the member countries on the research and development of the global coconut sector, 7th – 11th July 2014 with the theme "Policies, Programmes and Technologies Towards a Resilient and Sustainable Coconut Sector". The conference was hosted by the Ministry of Coconut Development and Janatha Estate Development in collaboration with the CRI and APCC. Besides the APCC



countries France, Brazil, China, Ivory Coast, Tanzania, Mozambique, Netherlands, Singapore, Trinidad and Tobago and USA also participated.

The highlight of the conference was the presentations made by experts in different fields. A total of 36 presentations were made of which 16 were by Sri Lankan experts from the state and private sector organizations.

Need for government policies relating to the resilient and sustainable development of the coconut sector, networking for implementing of integrated pest management programmes, strengthening the breeding programmes of individual countries, undertaking more clinical studies involving human subjects to elucidate the claims made on health benefits of coconut products and advancing technologies for value addition in downstream processing of coconut products were discussed in length. Finally, the participants formulated Recommendations of the XLVI APCC Coconut Conference 2014 aimed at the governments and coconut growers of different countries for the development of the global coconut industry.

The delegation visited laboratories of CRI on 11th July to acquaint with the recent research developments of coconut in Sri Lanka.

CRI partners with global health coconut products to formulate coconut water and coconut sugar



Coconut Research Institute entered into a research partnership with Global Health Coconut Products Ltd, Hong Kong to develop appropriate formulations and production technologies for stabilization and packing of coconut water and production of coconut sugar. This agreement was entered into on 24th July and the research programme will be conducted by the Coconut Processing Research Division under the leadership of Dr. C. Yalegama. In this research programme various combinations of ingredients will be used for deriving an optimum stabilization formulations relating to packing of tender and mature coconut water. Materials such as stevia, coconut sugar and coconut treacle will be used to make these formulations.

The memorandum of understanding (MOU) was signed on behalf of the Coconut Research Institute by its Chairman

Prof. H.P.M. Gunasena and for Global Health Coconut products by its Managing Director Mr. Somitra Agrawal.

Local Collaborations

CRI participated at the 5th Symposium of the Plantation Crop Research

The 5th Symposium of the Plantation Crop Research jointly organized by the Sugarcane, Tea, Rubber and Coconut Research Institutes was held 15-17 October 2014 at the BMICH, Colombo. The theme of the symposium was "Towards a greener plantation economy". The proceedings were inaugurated by his Excellency the President of Sri Lanka, Mahinda Rajapakse and graced by Hon. Basil Rajapakse, Minister of Economic Development and Hon. Ministers Sugar Industry Development, Plantation Industries and Coconut Development and Janatha Estate Development.

As a partner institute CRI actively participated at the symposium by presenting six research papers in the technical sessions on crop improvement, crop and resource management, environment, climate & soil and process, product & machinery development.



Joint research with universities to study health benefits of edible coconut products



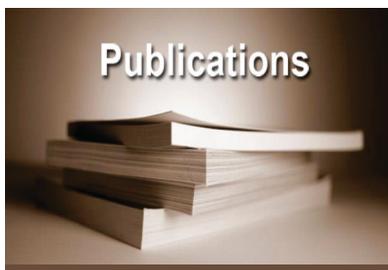
The Coconut Research Institute signed three formal agreements with the medical faculties of the University of Peradeniya, University of Kelaniya and General Sir John Kotalawala Defense Academy to undertake clinical studies on the health benefits of edible coconut products. This is an area which is not researched by many coconut growing countries of the world and very few clinical studies have been published in reputed journals. Also, even the published information has given inconclusive results. Therefore, the elucidation of the health benefits of edible coconut products has become an urgent need to promote the international trade in coconut products. After the introduction of virgin coconut oil consumers in the western countries have been searching for authoritative information on the health benefits of coconut oil. It is envisaged that mutual cooperation in research between



medical professionals of the universities and scientists of the Coconut Research Institute will unearth new evidence that will contribute to the well-being of humankind. Therefore, these studies are highly relevant to develop the coconut industry in the world.

A team of scientists led by Dr. P.H.P. Fernando, Biochemistry Department of the Medical Faculty, University of Peradeniya will undertake a "Feasibility study on ameliorating Type 2 diabetes in humans". The University of Kelaniya will undertake a "Randomized control trial of virgin coconut oil for the treatment of Alzheimer's Dementia". This study will be led by Dr. Shehan Williams of the Department of Psychiatry. The scientists of the Sir John Kotalawala will conduct a study to

"Determine the effectiveness of extra virgin coconut oil on people with mild cognitive impairment and mild to severe Alzheimer's disease in communities based on random, double blind placebo controlled study". These MOUs were signed by the Vice Chancellors of the respective universities. Prof. Atula Senaratne, University of Peradeniya, Prof. Sunanda Madduma Bandara, University of Kelaniya and Major General Milinda Peiris, Sir John Kotalawala Defense Academy signed on behalf of the respective universities. Prof. H.P.M. Gunasena, the Chairman Coconut Research Board, Sri Lanka, signed the MOUs on behalf of the Coconut Research Board. Under these MOUs, the Coconut Research Institute is expected to provide substantial amounts of funds over a period of three years.



LOCAL & INTERNATIONAL

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PROVISION OF SERVICES FOR RESEARCH & DEVELOPMENT

BIOMETRICAL SERVICES

Biometry Unit

published by the CRI were digitized.

BIOMETRICAL SERVICES

Biometry Unit provided 48 Biometrical consultancies on designing field experiments and analyzing data were provided to research staff of different divisions of CRI.

- b. Seventeen books were received on complimentary basis.
- c. Conducted 14 literature searches.

ENGINEERING SERVICES

Engineering Unit

LIBRARY SERVICES

Library

- a. The library continued converting into a digital library by digitizing it's contents of coconut literature under the National Science Foundation (NSF) project during the year. Nearly 140,000 pages of coconut literature including CRI staff publications from 1929 to 2004 and other publications

During this year construction of the retaining wall for chemical stores and toiled complex at Bandirippuwa Research Station and renovation of men's hostel and some staff quarters were completed in addition to attending to routine maintenance of vehicles and buildings. Painting works of the Head Office building and canteen block and tar laying of roads around the Head Office building were completed.

ESTATE MANAGEMENT

ACTIVITIES



ESTATE MANAGEMENT ACTIVITIES



Awards received by State Management Division

GENERAL

Coconut Research Institute owns ten estates managed by the Estate Management Division. It comprises of 4 Genetic Resource Centers (GRC) and 6 Sub Research Centers (RC) situated in various parts of the country. During the year they were satisfactorily maintained as a self-financed unit. The total extent of all estates is 3,148 ac., out of which 1,980 ac. are GRC and 1,168 ac. are RC and model gardens.

The primary objective of the estates is to maintain them estates to produce high quality seed nuts for the national seedling requirement and facilitate research divisions of CRI to carry out field research under various agro ecological regions and different soil types. The facilities provided to the research included labour, land, materials and management of pests and diseases. Further, live demonstrations

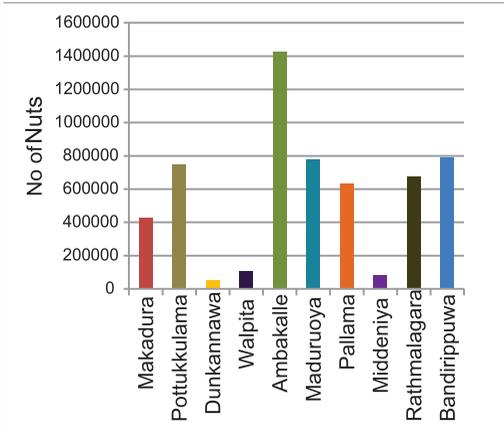
were maintained for dissemination of new technologies to scientists, plantation managers, coconut growers, university students, and school children and other visitors. In addition, the rest of the land of each estate was maintained satisfactorily with over 90% palms fertilized and with appropriate agronomic practices to obtain high profits.

The yield in 2014 was nearly 5.7 million nuts, which was about 1.5 million nuts higher than 2013. Remarkably, the highest yield of 5,719 million nuts was achieved from CRI estates in 2014.

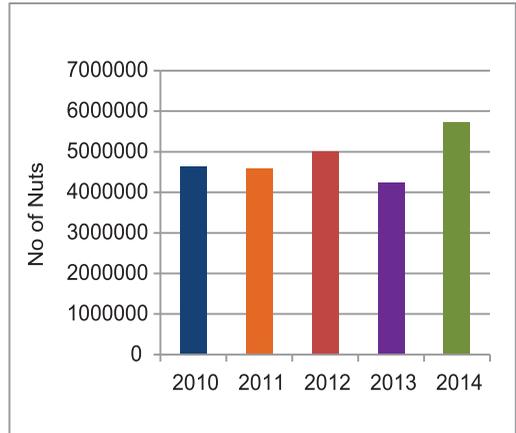
A noteworthy achievement by the division was winning the Social Dialogue & Workplace Co-operation Awards 2014. Gold, silver and bronze awards were received by Makandura GRC, Middeniya RC and Dunkannawa RC respectively.

For the second time, a bonus was given to permanent staff and laborers of the estates, which made profits during the year.

Bandirippuwa RC facilitated the annual cricket tournament.



Yield (number of nuts) picked in different estates of CRI in 2014

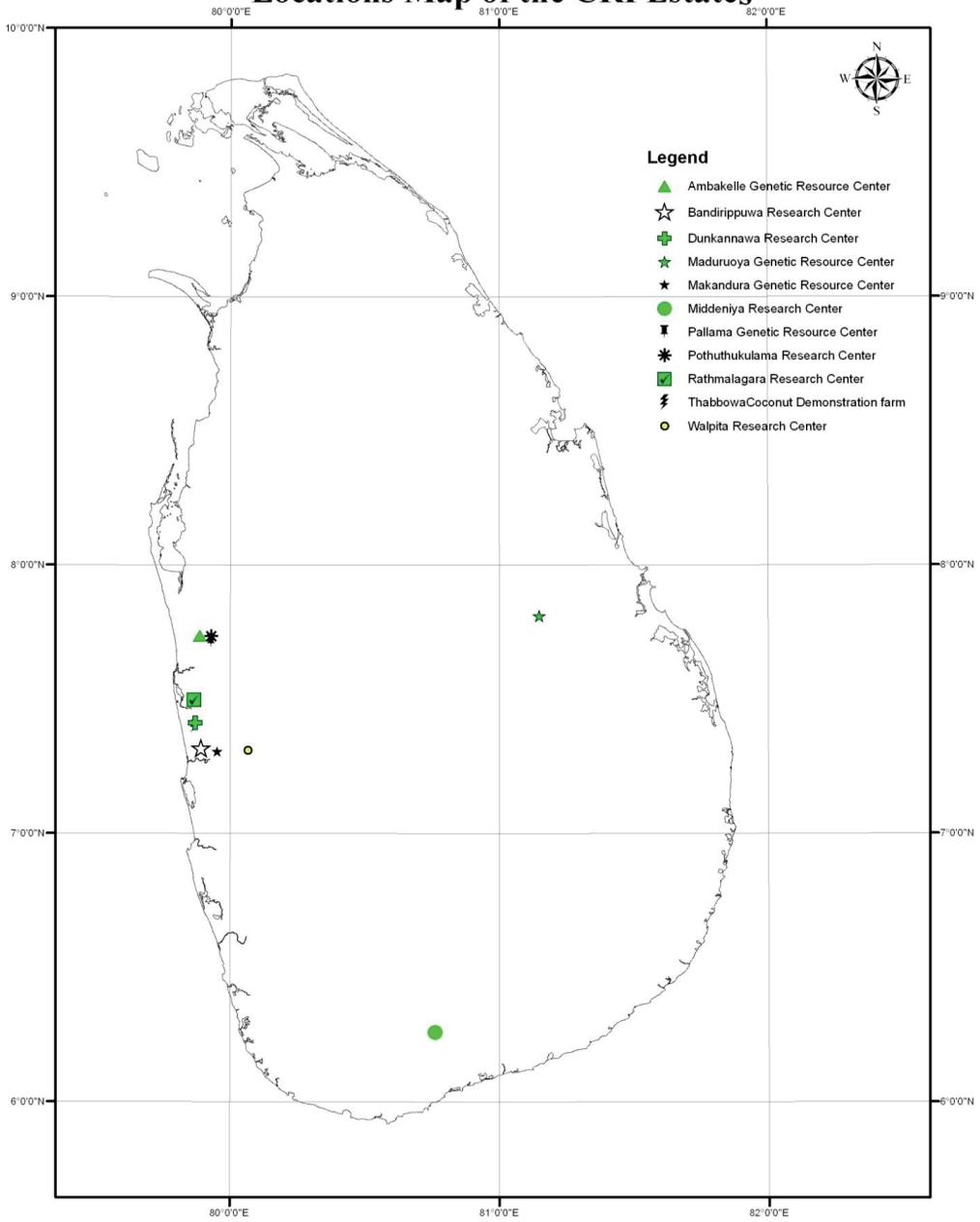


Yield (number of nuts) obtained from 2010 to 2014 from CRI estates.



Minister of Coconut Development and Janatha Estate Development addressing the gathering at the ceremony of distribution of bonus

Locations Map of the CRI Estates



Scale 1:2,000,000

Ambakele Genetic Resource Centre (AGRC)

Superintendent - W. A. Herald Upali



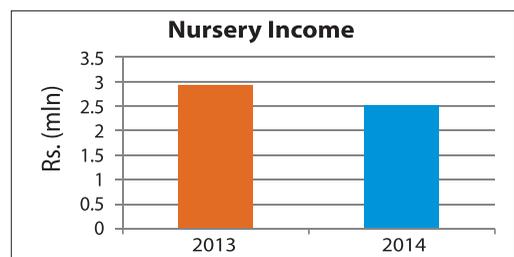
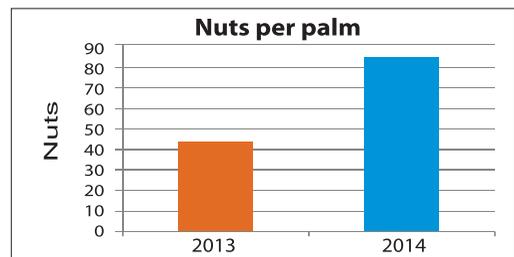
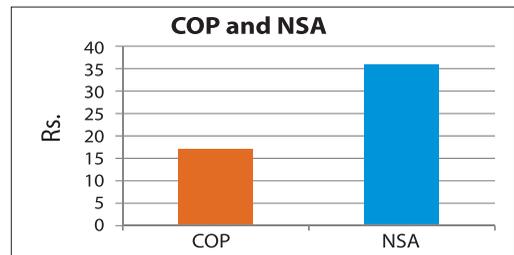
The estate manages a commercial nursery and also a popular site for training programmes.



AGRC is situated in Pallama (Puttalam district; North Western Province) in the intermediate dry zone and it has an extent of 456.2 ha. The Seed Garden produces high quality TallxTall (CRIC60) and Dwarf x Tall (CRIC65) hybrid seed nuts to supply for the national seedling requirement. During 2014, 1,078,102 seed nuts of CRIC60 and CRIC65 have been produced. There were 16,917 bearing palms and 1,276 non – bearing palms in the estate.

A new hand pollination program was initiated to produce DGXSan Raman Tall (Kapruwana) seednuts. A total of 2,967 seed nuts of Kapruwana were produced during the year. A new planting programme of the second generation was initiated in field No. 04.

This estate achieved the highest nut production of its history in 2014. The estate gained a total income of Rs. 54.1mln while the expenditure was Rs. 26.4mln. The profit was nearly 3 times that of 2013. The estate produced 3,710 1L of curd from the herd of 40 buffaloes.



Pallama Genetic Resource Centre (PGRC)

Officer- In-Charge - W.W.D.R Wijesinghe

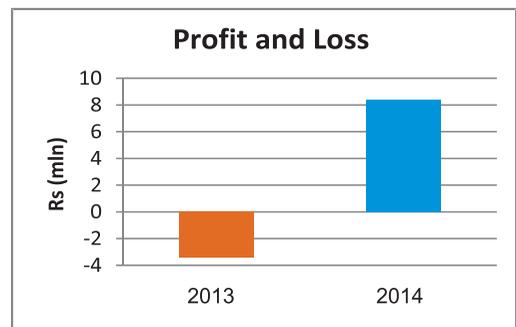
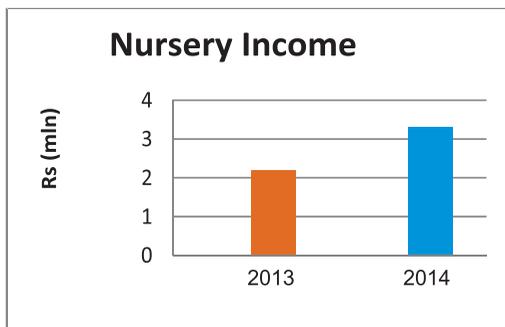
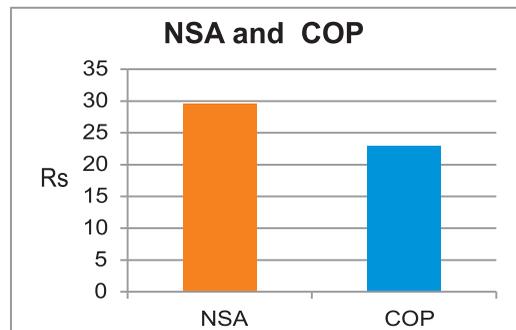
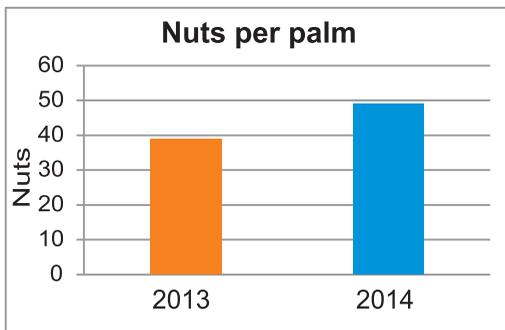


Pallama Genetic Resource Centre (PGRC) with an extent of 243.32 ha is situated in the Puttalam district (North Western Province) in the intermediate dry zone. The plantation consists of 12,899 bearing palms and 999 non-bearing palms. The main function of this estate is to produce TallXSan Ramon (CRISL98) seednuts, which is produced at PGRC only. In 2014, 40,910 CRISI 98 seed nuts were issued to coconut nurseries. Also, 7,931 seedlings, 1,034 seedlings and 8,892 seed nuts of Kapruwana, Kapsetha and Kapsuwaya

were produced by hand pollination respectively. This estate achieved the highest production of 630,840 nuts in 2014 compared to 465,000 in 2013.

Trials conducted in the estate were mapping QTL of segregation populations governing tolerance to *Aceria* mite, screening of coconut varieties/ cultivars for mite tolerance and evaluation of exotic crosses. It also holds a coconut gene bank. Pallama GRC maintains a large nursery for TSR seedling production. Also, rearing of cattle is done for milk production and weed control.

The estate gained an income Rs. 26.16mln while the expenditure was Rs. 17.75 mln. It achieved the highest crop production in 2014.



Makandura Genetic Resource Centre (MGRC)

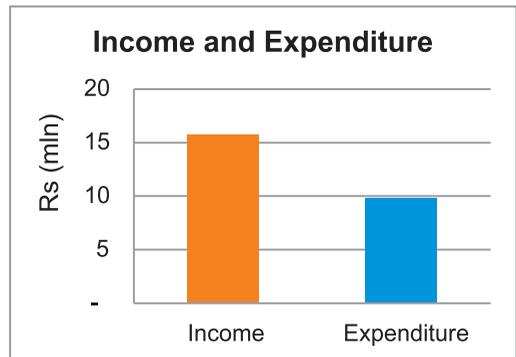
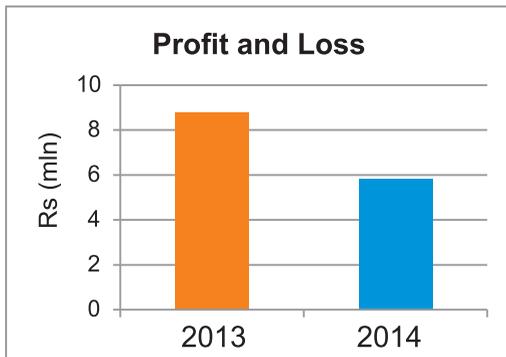
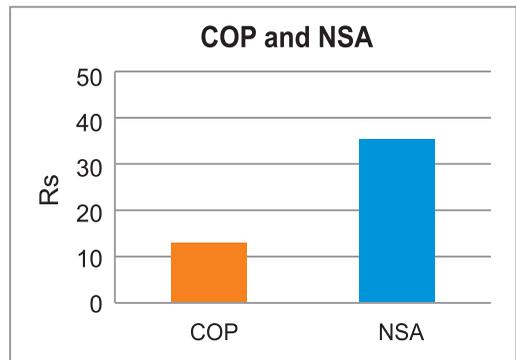
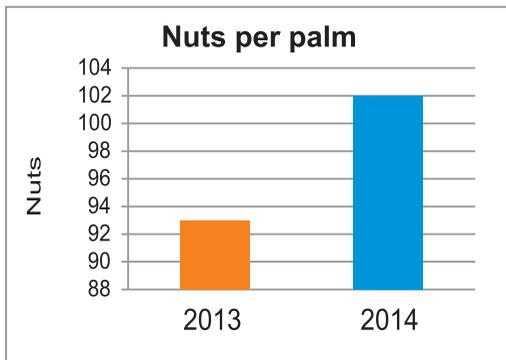
Superintendent - D.P.S.K. Hettiarachchi



Makandura Genetic Resource Centre with an extent of 56.28 ha is situated in the Kurunegala district (North Western Province) and belongs to intermediate dry zone. The estate is maintained as a live demonstration of intercropping and agro forestry systems and also a model coconut

garden. The estate has 4,200 bearing palms and 1,033 non – bearing palms.

The estate gained a total income of Rs. 15.73mln including Rs.0.5 mln from sale of intercrops. The total expenditure was Rs. 9.8 mln.



Maduruoya Genetic Resource Centre (MOGRC)

Office in Charge - Mr. A.A.S. Alahakoon



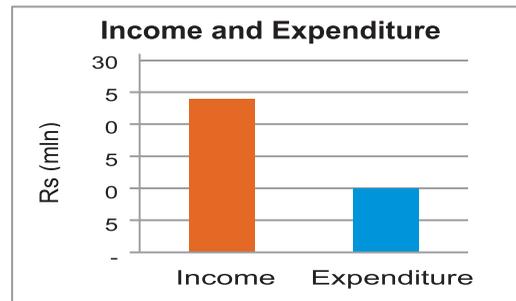
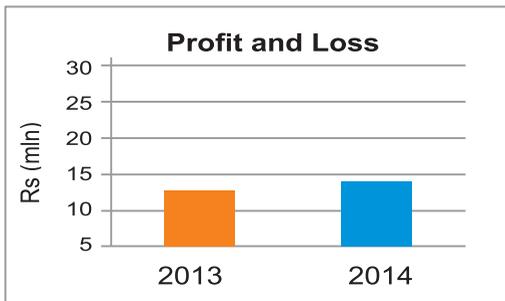
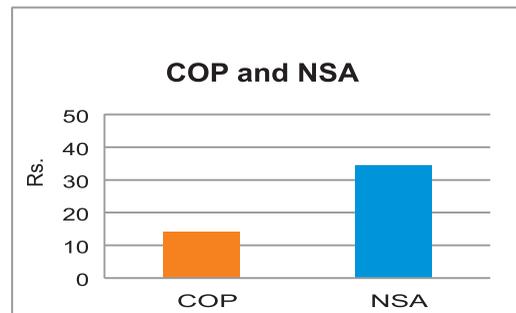
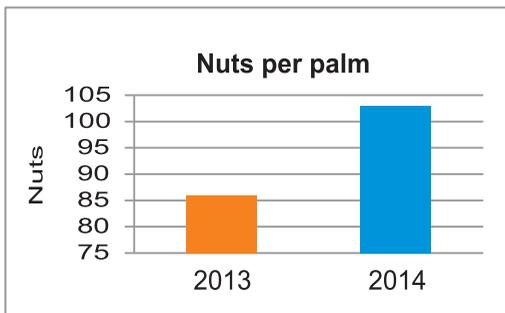
Maduruoya Genetic Resource Centre (MOSG) situated in the Dry Zone (Polonnaruwa district) has an extent 86.64 ha. There were 7,546 bearing and only 785 non – bearing palms in 2014. This estate achieved the highest nut production of 776,226 in 2014 compared to past years.

The estate produced 407,330 seed nuts of TxT during the year.

Three research studies are being carried out

in the estate; evaluating buffalo slivo-pastoral system, evaluating mixed cropping with forest trees for reducing heat stress for coconut and evaluation the performance of oil palm in dry zone.

The estate gained income Rs. 24.08 mln (including other income of Rs. 0.2 mln) while the expenditure was Rs. 10.25 mln. The estate had a herd of 61 buffaloes reared for weeding.



Bandirippuwa Research Centre (BRC)

Superintendent -W.M.U. Rathnayake



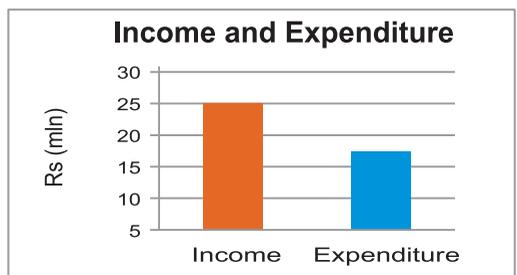
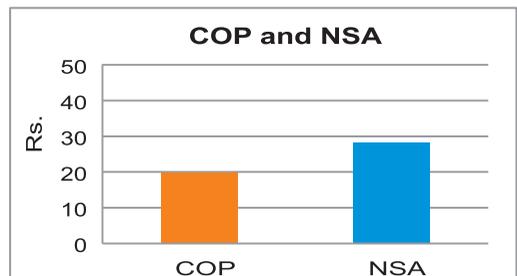
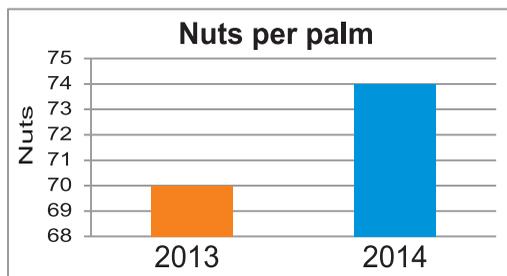
The 140.08 ha Bandirippuwa Research Centre (BRC) situated in the Puttalam district (North Western Province) is in the Intermediate Wet zone and house the Head Quarters of the Coconut Research Institute.

It has 10,706 bearing palms and 3,563 non - bearing palms. This estate achieved highest nut production of 792,279 nuts in 2014 compared to past years.

The estate supported 04 research trials providing maintenance and other facilities. The *ex-situ* field gene bank for improved

exotic coconut genetic resources is established at BRC. This gene bank currently holds 20 coconut varieties imported from India, Papua New Guinea and Ivory Coast. It also consists of a collection of "Dikiri" coconut palms produced from embryo culture technology and a demonstration block of different intercropping models. BRC facilitated the Technology Park of the Institute.

A dairy was maintained and toddy tapping was done for production of milk and treacle for sale. A 5ac. pineapple block is managed.



Rathmalagara Research Centre (RRC)

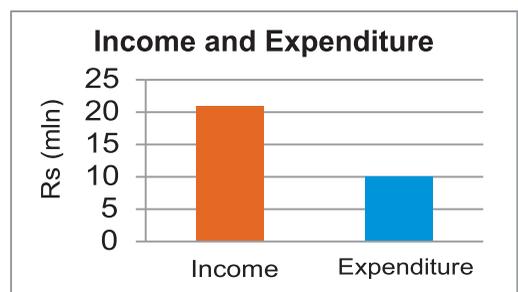
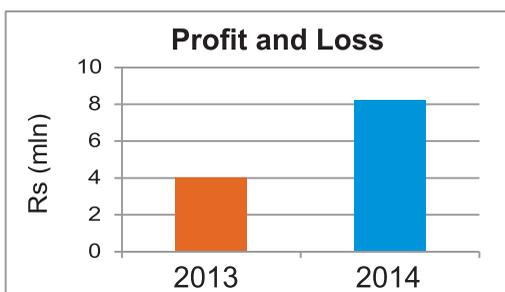
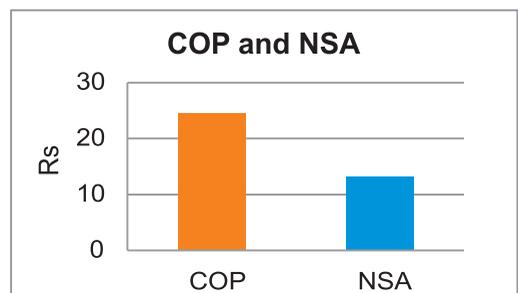
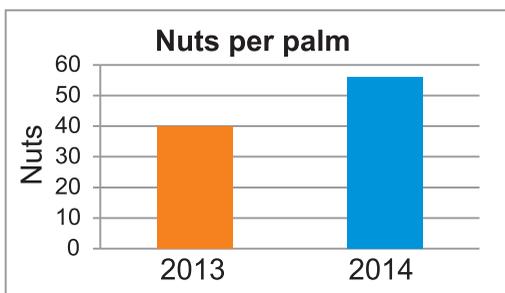
Superintendent -G.B.A. Wijsekara



Rathmalagara Research Centre (RRC) with an extent of 110.53 ha is situated in the Puttalam district (North-western Province) in the intermediate dry zone. The estate mainly supports field research studies of various divisions of the Institute; evaluating various crosses for yield and tolerance to moisture stress and developing appropriate cultivation practices for organic coconut production and managing plant and soil nutrients for maintaining soil fertility, maintained demonstrations on animal farming systems including poultry, goat and cattle. In addition a bio-energy generating plant is installed.

A well maintained commercial nursery is established in the estate. An under planting of 50 ac. were completed.

In 2014 the estate had 12,102 bearing palms and 1,869 non-bearing palms. RRC has doubled its profit in 2014 compared to 2013 and achieved the highest nut production in the recent past. The total income of the estate was Rs. 21.15 mln while the expenditure was Rs. 12.9 mln. Income was generated by selling coconut, coconut seedlings and milk.



Poththukulama Research Centre (PRC),Pallama

Officer in Charge - W.W.A.P.R. Fernando

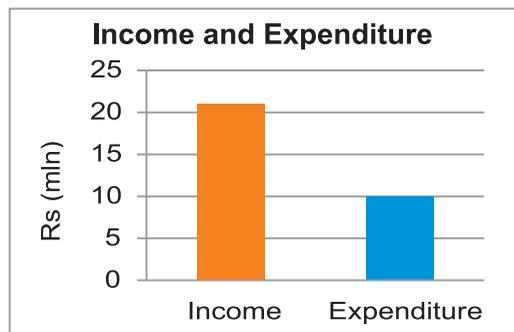
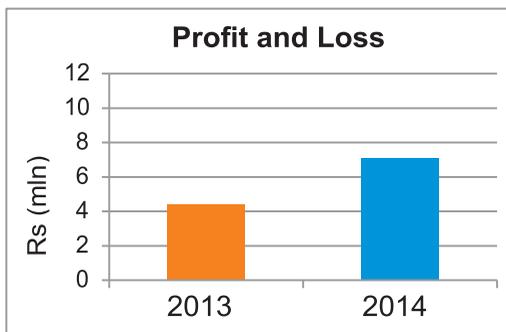
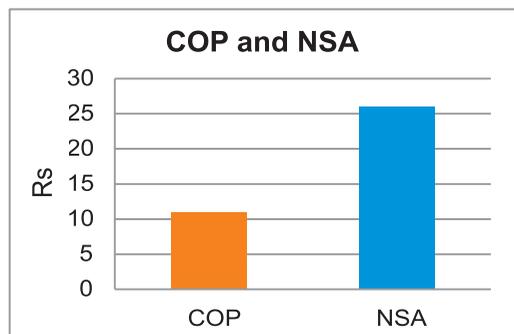
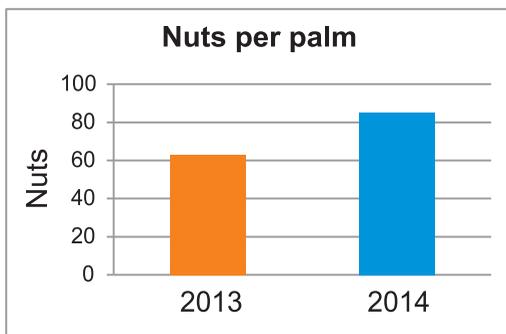


Poththukulama Research Centre with an extent of 85.83 ha is situated in the Puttalam district belonging to the Intermediate dry zone. PRC maintains few field experiments and accommodates the largest and the oldest collection of tall coconut germplasm. There is a well-established *ex – situ* field gene bank comprising of 22 tall and 02 exotic dwarf coconut accessions. A demonstration block of 12 different coconut hybrids has also been established at PRC. The estate main trial conducted was screening of

coconut varieties/ cultivars for mite tolerance and coconut genome mapping population in coconut gene banks.

The estate consisted of 8,844 bearing palms and 2,125 non-bearing palms. A higher yield of 747,838 was obtained and was the highest nut production compared to past years.

The estate gained an income Rs.21.34 mln while the expenditure was Rs.10.53 mln.



Walpita Research Centre (WRC) Walpita

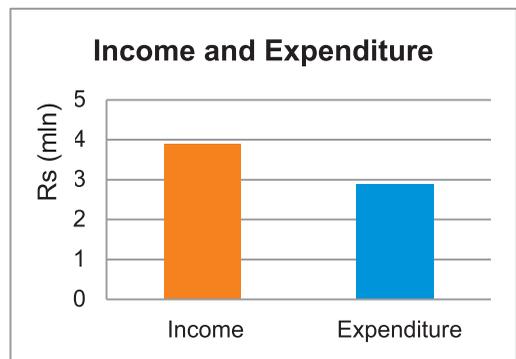
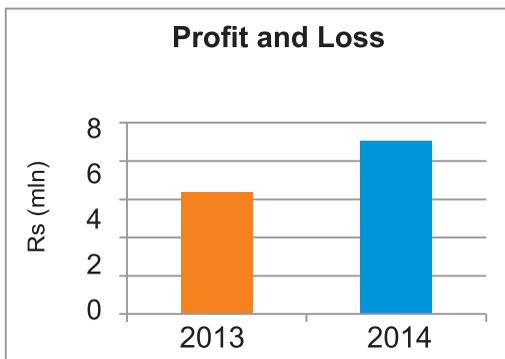
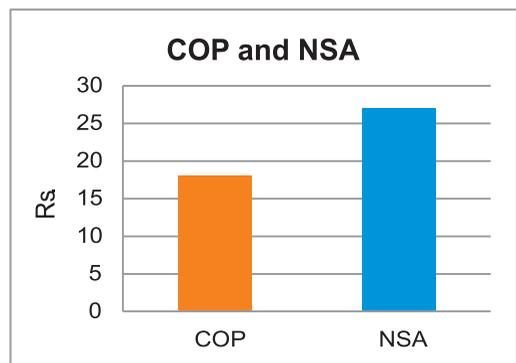
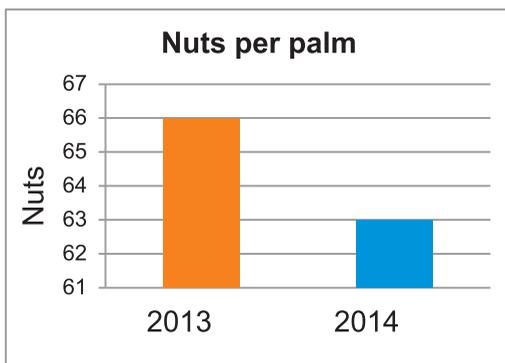
Officer in Charge - I.A.N. Hemasiri



Walpita Research Centre with an extent of 17.8 ha in the Gampaha district is the only estate located in the wet zone. It supported field research of the Genetics and Plant Breeding Division. A single population of a cross between Sri Lanka tall is established in an area of 3.23 ha in the estate and this is

shown to be an early flowering and profusely bearing block of coconut.

This estate achieved highest nut production of 107,963 in 2014 compared to past years.



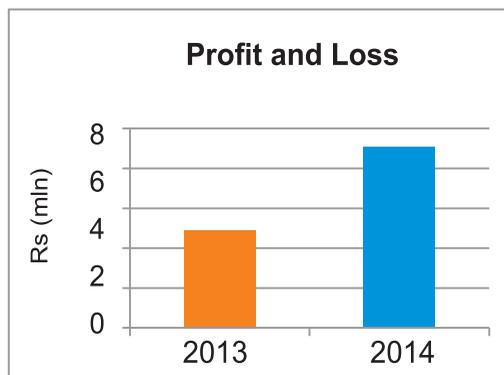
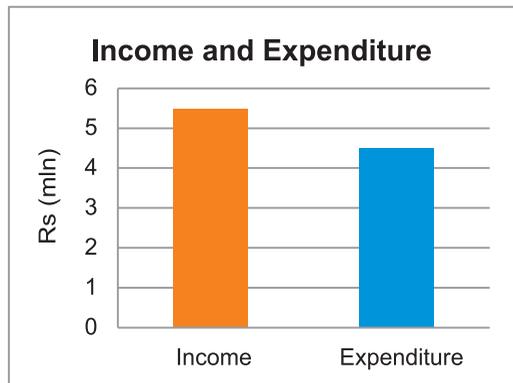
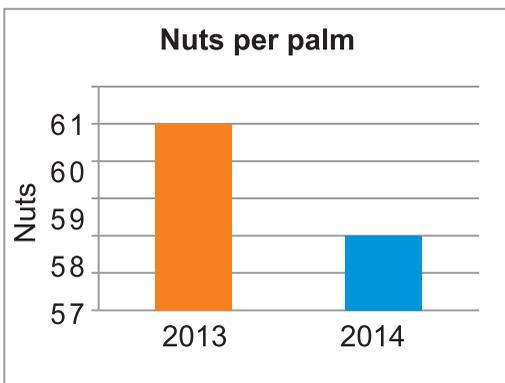
Dunkannawa Research Centre (DRC),Naththandiya

Officer in Charge - S.A. Sudath Kumara



Dunkannawa Research Centre has an extent of 10.12 ha and located in (Puttalam District) the Intermediate Dry Zone. There were 867 bearing palms and

254 non-bearing palms. A total of 50,000 nuts were harvested during the year. No research studies have been conducted in the estate during 2014.



Middeniya Research Centre (MRC) Middeniya

Office in Charge - Nuwan Menaka

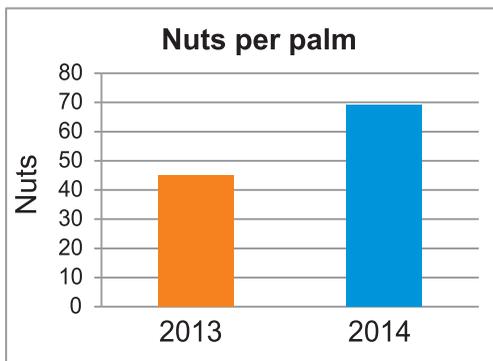


Middeniya Research Centre is located in the mini coconut triangle of Hambanthota district in the Intermediate Dry Zone. It has an extent of 30.37 ha. It comprises of 1,207 bearing palms and 163 non – bearing palms. This estate achieved the highest nut production in 2014 compared to past year.

Two research trials were conducted at Middeniya RC to which the estate provided maintenance and other facilities.

One of these trials was the evaluation of exotic crosses conducted by GPB division.

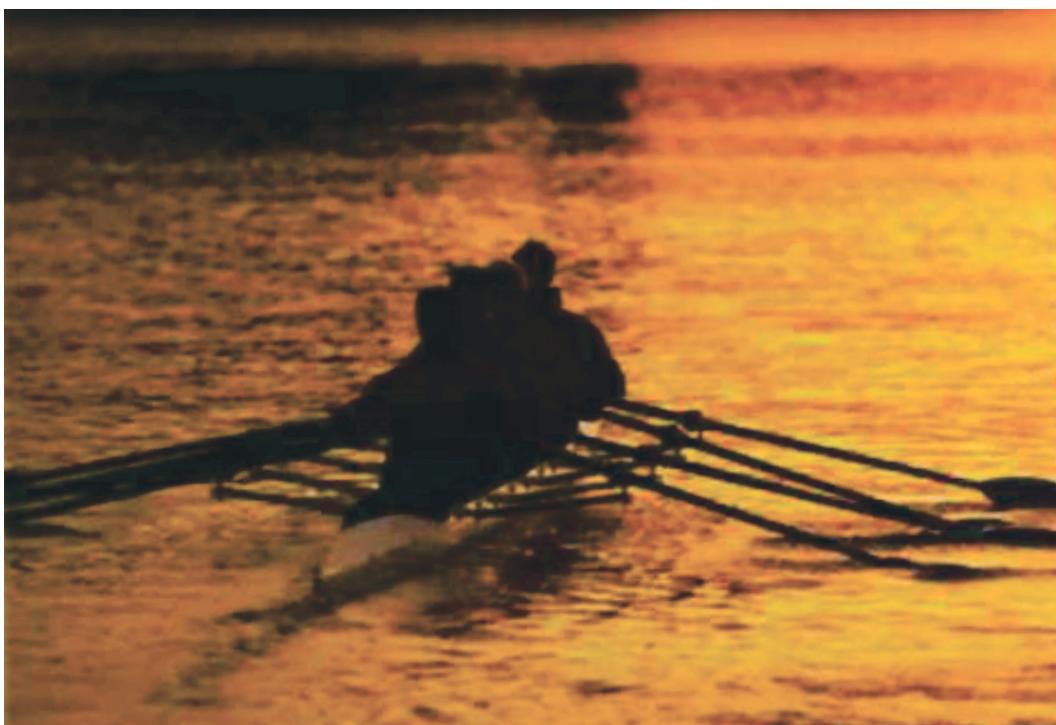
The other one is the evaluation of a model drought management system in the Middeniya RC representing majority of the soils and climatic conditions of the coconut mini triangle conducted by Plant Physiology Division.



FINANCIAL SITUATION OF 2014 – ESTATE MANAGEMENT DIVISION

	ACTUAL TOTAL 2014 Rs.	BUDGET 2014 Rs.	ACTUAL TOTAL 2013 Rs.
REVENUE			
SALES OF COCONUT	167,562,325.24	127,987,000.00	126,319,366.20
SALES OF COPRA	2,799,885.10	2,062,000.00	4,185,654.40
SALES OF SEEDLING	11,120,155.19	13,558,000.00	9,825,365.95
SALES OF SUNDRIES	4,989,215.84	9,415,000.00	4,051,815.61
SALE OF ANIMALS PRODUCE & ANIMALS	1,697,784.76	3,804,000.00	6,828,008.40
TOTAL REVENUE	189,344,633.10	156,826,000.00	152,365,693.64
STOCK VARIANCES			
STOCK VARIANCES	57,184,158.15		43,746,381.01
	13,437,777.14	156,826,000.00	7,394,053.71
ESTATE REVENUE	202,772,410.24	136,434,000.00	159,759,747.35
GENERAL CHARGES	52,061,229.14	45,219,000.00	39,120,133.08
STAFF SALARIES	25,953,475.18	18,766,000.00	22,271,273.09
UPKEEP	25,238,051.32	20,310,000.00	13,945,352.22
CUTIVATION	8,652,741.43	13,760,000.00	11,051,626.03
HARVESTING	10,888,749.17	8,635,000.00	8,933,791.49
DEPRECIATION	2,458,632.63	-	5,269,559.47
TOTAL COST OF PRODUCT	125,252,878.87	106,690,000.00	100,591,735.38
CURING INTO COPRA/DISPOSE	1,693,864.88	679,000.00	1,559,688.28
ANIMAL HUSBANDRY	3,412,939.07	3,120,000.00	4,316,238.92
COST OF SEEDLING		8,050,000.00	6,736,440.73
AMORTIZATION	4,742,272.20		3,189,244.65
TOTAL EXPENDITURE	135,101,955.02	118,539,000.00	15,801,612.58
NET SURPLUS/(DEFICIT)	<u>67,670,455.22</u>	<u>38,287,000.00</u>	<u>43,366,399.39</u>

STAFF





STAFF ACHIEVEMENTS

Awards

Dr. N. S. Aratchige received Presidential award for contribution to the research on coconut mite management.

Dr. L. C. P. Fernando received the Presidential research award awarded by National Research Council of Sri Lanka for scientific publications in high impact Science Citation Index Journals.

Dr. L. C. P. Fernando received a merit award awarded by National Research Council of Sri Lanka for scientific publications in Science Citation Index Journals.

Dr. L. Perera received the Lifetime Research Excellence Award in Coconut Research Awarded at the 5th Plantation Crops Research Symposium.

Dr. L. Perera, Mr. M.G.M.K. Meegahakumbura and Dr. H.T.R. Wijesekara received a National award for excellence in agricultural research for the "Identification of the causal agent of the WCLWD" awarded by Council for Agricultural Research Policy, Sri Lanka.

Dr. L. Perera received a merit award awarded by National Research Council of Sri Lanka for scientific publications in Science Citation Index Journals.

Dr. S. A. C. N. Perera received an award for excellence in research at CRI during 2012-

2013 at the 5th Plantation Crops Research Symposium.

Dr. S. A. C. N. Perera received a National award for excellence in agricultural research for the research project titled, 'Assessment of the Genetic Diversity of Coconut with Special Reference to Phenotypes in the Southern Province of Sri Lanka' awarded by the Council For Agricultural Research Policy, Sri Lanka. Research team: S.A.C.N. Perera, G.K. Ekanayake, P. N. Dassanayaka and J. M. D.T Everard.

Dr. S. A. C. N. Perera received the Best paper and the presentation award in the coconut sector at the 5th Plantation Crops Research Symposium.

Mr. K. F. G. Perera received the Presidential research award awarded by National Research Council of Sri Lanka for scientific publications in high impact Science Citation Index Journals.

Mr. M. G. M. K. Meegahakumbura received the best paper and presentation award at the "Second Prof.Wu Zhang-Yi's memorial postgraduate symposium" organized by the Key Laboratory for Plant Diversity and Biogeography of East Asia held on 2015.01.20 at the Kunming Institute of Botany, Chinese Academy of Science.

Mr. M. G. M. K. Meegahakumbura received Best presenter 3rd prize for the presentation

made at the "Annual symposium of the Germplasm Bank of Wild Species" held on 28.12.2014 at the Kunming Institute of Botany, Chinese Academy of Science.

Mr. P. H. P. R. de Silva received the Presidential research award awarded by National Research Council of Sri Lanka for scientific publications in high impact Science Citation Index Journals.

Dr. L. L. W. C. Yalgama received merit award for Post Graduate Research on "Characterization and nutritional effects of cell wall polysaccharides from coconut kernel" at the SLAAS annual session held in 2014.

Dr. V. R. M. Vidhanaarachchi received the President's Award for Scientific Publication, for publishing research in Science Citation Indexed Journal.

Dr. H. D. D. Bandupriya received the President's Award for Scientific Publication, for publishing research in Science Citation Indexed Journal.

Research Grants

Dr. L. Perera as PI: National Research Council of Sri Lanka funded research grant on "Investigation of the course of tapering disorder of coconut in Sri Lanka and molecular characterization of the pathogen". National Research Council (Grant No. NRC/13/31), (2013-2016) (In progress).

Dr. S. A. C. N. Perera as PI: Comparative Analysis of Sri Lankan Coconut Germplasm with the Global Coconut Germplasm Data Available in the International Coconut Genetic Resources Database (CGRD)' Bioversity International (2013-2016) (In progress).

Dr. S. A. C. N. Perera as PI: Determination of the genetic structure of yellow dwarf coconut population in Sri Lanka" National Research Council (2012-1014) (In progress).

Dr. H. D. D. Bandupriya as PI (Co-I: Dr. V Vidhanaarachchi and Dr. S A C N Perera) Studies on cryopreservation of embryonic callus from unfertilized ovaries using the encapsulation – dehydration technique and post thaw plant regeneration coconut. National Science Foundation. (2014-2016) (In progress).

Dr. C. S. Ranasinghe as PI, (Co I: Dr. L. Perera) 'Determination of the effects of heat and water stress on fertility of female and male reproductive organs of coconut (*Cocos nucifera* L.)'. National Research Council (NRC) (Grant No. NRC/13/32) (In progress).

Dr. H. M. I. K. Herath received travel grant from National Science Foundation of Sri Lanka & International Union of Soil Science for attending and presenting a paper at 20th World Congress of Soil Science, Jeju, South Korea, June 2014.

Conferences, Workshops held

CRI in collaboration with the Ministry of Coconut Development & Janatha Estate Development organized the XLVI APCC – COCOTECH conference and coconut festival 2014 held at BMICH from 7 – 11 July 2014.

Staff of the Genetics and Plant Breeding Division organized the 17th International Steering Committee meeting of the Coconut Genetic Resources Network (COGENT) in Collaboration with Bioversity International, Coconut Research Institute, 13-16 July 2014.

A workshop on “Enhancing the productivity of Sri Lankan coconut sector through SME lending mechanism” was organized by the Agric. Economics and Agribusiness Management Division for the stakeholders in the coconut sector on 17 June, 2014.

Postgraduate Studies Completed

Dr. Ms. S. C. Somasiri successfully completed her postgraduate studies leading to Ph.D. degree at the Institute of Veterinary, Animal and Biomedical Sciences (IVABS), Massey University, New Zealand on 12th August 2014.

Ms. M. K. F. Nadheesha, Research Officer, Soils & Plant Nutrition Division successfully completed her postgraduate studies leading to M.Sc. degree at the Eastern Illinois University, USA with effect from 27th January 2014.

Post graduate studies undertaken

Mr. H. C. Mendis, Research Officer, Plant Physiology Division is reading for PhD degree at the Florida State University, USA from 11 August 2009.

Ms. K. P. Waidyaratne, Research Officer, Biometry Unit reading for PhD degree at the Lincoln University, New Zealand from 14 March 2011.

Mr. A. D. N. T. Kumara, Research Officer, Crop Protection Division reading for PhD degree at the University of Agricultural Sciences, GKVK, Bangalore, Karnataka, India from 21 August 2012.

Mr. M. G. M. K. Meegahakumbura, Research Officer, Genetics & Plant Breeding Division

reading for PhD degree at the Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, China from 10 September 2012.

Ms. P. M. E. K. Pathiraja, Research Officer, Agricultural Economics & Agribusiness Management Division reading for PhD degree at the University of Melbourne, Australia from 20 December 2012.

Ms. H. D. M. A. C. Dissanayake, Research Officer reading for PhD degree at the University of Tsukuba, Japan with effect from 01 April 2013.

Ms. N. I. Suwandhrathne, Research Officer, Crop Protection Division continued her postgraduate studies leading to M.Sc. degree at the Post Graduate Institute of Science, Peradeniya from 06 April 2010.

Ms. J. A. K. M. Fernando, Assistant Mechanical Engineer continued her postgraduate studies leading to M.Phil. degree at the University of Moratuwa from 05 January 2012.

Local training programmes (More than 7 days)

Mr. S. S. Rajapaksha, Technical Officer followed a Diploma in Hardware Engineering with Networking at Turnkey Computer Systems (Pvt) Ltd, from 25 May (1 ½ months in weekends)

Overseas trainings

Mr. A. A. A. J. Atapattu attended International Training on Research Methods in Agroforestry, India from 30 November – 6 December, 2014.

Served in Committees in outside organizations

Dr. L. Perera served as Chairman of the National Plant Breeding Committee of the Council of Agricultural Research Policy (CARP), Sri Lanka.

Dr. L. Perera served as a Member, Scientific Advisory Committee, Tea Research Institute, Sri Lanka

Dr. S. A. C. N. Perera served as Chairperson of the National Biotechnology Committee of the Council of Agricultural Research Policy (CARP), Sri Lanka.

Dr. L. Perera served as the Country Representative and the Chairman of International Coconut Genetic Resources Network (COGENT), Bioversity International.

Dr. S. A. C. N. Perera served in the National Sub-committee for Kitul Development.

Dr L. C. P. Fernando represented the Coconut Research Institute at the Pesticide Technical Committee of the Department of Agriculture.

Dr. N. S. Aratchige represented the Coconut Research Institute at the Pesticide Subcommittee of the Department of Agriculture.

Dr. H. T. R. Wijesekara served as the representative of CRI for Plant Protection Committee of the Council for Agricultural Research Policy.

Dr. N. S. Aratchige represented the Coconut Research Institute at the Committee to inspect and approve oil palm seedlings and nurseries.

Dr S. A. C. N. Perera served in a committee appointed by COSTI for the formulation of the articles of Biotechnology Association of Sri Lanka.

Dr. C. S. Ranasinghe served as the coconut sector representative for the development of National Action Plan and Technology Needs Assessment for climate change adaptations in plantation and export agriculture sectors at the Ministry of Environment.

Dr. N. P. A. D. Nainanayake chaired the session on "Climate change and environmental valuation" of the WinC (Wayamba International Conference) of the Wayamba University held from 29 – 30 August 2014.

Dr. N. P. A. D. Nainanayake participated in the judging panel member of the 13th Agricultural Research Symposium (AGRES) of the Faculty of Agriculture and Plantation Management of Wayamba University.

Dr. H. M. I. K. Herath served as a member of the steering committee of Young Scientists Forum of National Science & Technology Commission, Sri Lanka.

Dr. H. M. I. K. Herath served as an Executive Committee member of Soil Science Society of Sri Lanka.

Dr. I. M. S. K. Idirisinghe served as a Committee Member of the National Committee on Socio Economics and Policy Analysis, Sri Lanka Council for Agricultural Research Policy.

Dr. I. M. S. K. Idirisinghe served as Vice President to Sri Lanka Agricultural Economics Association.

Dr. I. M. S. K. Idirisinghe appointed as the President of the Sri Lanka Agricultural Economics Association.

Served in Committees at CRI

Dr. H. A. J. Gunathilake, Dr. L. C. P. Fernando, Dr. A. Tennakoon, Dr. L. Perera, Dr. C. S. Ranasinghe, Dr. C. Yalagama, Dr. T. Wijesekara, Dr. V. Vidhanarchchi, Dr. S. Idirisinghe, Dr. S. Senarathne, Dr. I. Wijebandara, Dr. C. Perera, Dr. N. Aratchige, served as members, Internal Research Committee, CRI.

Dr. N. P. A. D. Nainanayake, Dr. C. S. Ranasinghe and Mr. D. P. Kumarathunga worked in organizing the XLVI APCC – COCOTECH conference and coconut festival 2014 held at BMICH from 7 – 11 July 2014.

Dr. N. P. A. D. Nainanayake Worked as an organizing committee member of the International Symposium on Organic Coconut farming held at CRI on 28th November 2014.

Dr. N. P. A. D. Nainanayake worked as either chairman or a member of more than 15 Technical Evaluation Committees and prepared relevant TEC reports.

Dr. D. M. D. I. Wijebandara served as a chairperson of 10 Technical Evaluation Committees in Coconut Research Institute.

Dr. D. M. D. I. Wijebandara served as a member of Technical Evaluation Committee (TEC) to purchase Atomic Absorption Spectrophotometer (AAS) to SPND - (2014/NCB/12)

Dr. H. M. I. K. Herath served as a committee member of the secretariat and the convener of the committee on conference venue at the XLVI APCC COCOTECH conference and coconut Festival held at BMICH, Colombo 7-11 July 2014.

Dr. H. M. I. K. Herath served as member of 19 Technical Evaluation Committees in Coconut Research Institute.

Overseas visits

Dr. H. A. J. Gunathilake attended World Congress on Agroforestry 2014, New Delhi, India from 9 – 15 February, 2014.

Dr. C. S. Ranasinghe presented a paper in the World Congress on Agroforestry 2014, Trees for Life: Accelerating the Impact of Agroforestry, New Delhi, India from 9-15 February, 2014.

Dr. H. M. I. K. Herath attended and presented two research papers at 20th World Congress of Soil Science, Jeju, South Korea, June 2014.

Dr. N. S. Aratchige attended as a focal point expert at the consultative workshop on mite management in coconut in SAARC countries held in Dhaka, Bangladesh from 10th to 11th August, 2014.

Dr. H. A. J. Gunathilake gave a presentation on coconut development in Sri Lanka at the Chinese Academy of Tropical Agriculture Sciences, People's Republic of China from 6-10 October, 2014.



ACADEMIC AND PROFESSIONAL ACHIEVEMENTS

Members in Editorial Boards

Dr. C. S. Ranasinghe served as a member of Editorial committee of the Journal of the National Institute of Plantation Management (NIPM).

Supervision of Postgraduate Students

Dr. S. A. C. N. Perera acted as the supervisor of the M Phil research project of Ms. L. C. J. Kamaral, University of Sri Jayawardenepura.

Dr. S. A. C. N. Perera acted as the supervisor of the PhD research project of Ms. K. N. S. Perera, University of Sri Jayawardenepura.

Dr. S. A. C. N. Perera acted as a Research Advisor of the PhD research project of Ms. Noel Piyasundera, PGIA, Peradeniya.

Dr. C. S. Ranasinghe supervised M Phil research project of Ms. A. Amarasinghe, a student of Postgraduate Institute of Wayamba University on 'Determination of the effects of heat and water stress on fertility of female and male reproductive organs of coconut (*Cocos nucifera* L.)'.

Supervision of Undergraduate Students

Mr. A. A. A. J. Atapattu supervised a B.Sc. (Agriculture) final year research project of Miss. M. G. N. C. K. Piyarathne at Uva Wellassa University of Sri Lanka. The title of the project was "Evaluation of Soil Physico chemical Parameters in Different Coconut Based Multiple Cropping Systems".

Mr. A. A. A. J. Atapattu supervised a B.Sc. (Agriculture) final year research project of Miss. D. S. Lyanagedaraat Uva Wellassa University of Sri Lanka. The title of the project was "Diversity, Abundance and Functional Roll of Soil Organisms in Different Coconut Based Multiple Cropping Systems".

Dr. N. S. Aratchige supervised the research project of H M Buddini Herath, undergraduate student of University of Uva Wellassa on "Storage temperature and shelf life of Neoseiulus baraki sachets".

Ms. N. I. Suwandharathne supervised student project of D. P. L. Rupasinghe, Diploma student of Aquinas College, Colombo 10, on "Mass rearing of Plesispa Beetle".

Dr. L. Perera supervised Miss. Tharika Sewwandi Baddegama of the Advance Technological Institute, Naiwala on her industrial training component.

Dr. L. Perera supervised the research project of Mr. D. M. G. A. Dissanayake on his Diploma in Plantation Management at the National Institute of Plantation Management.

Dr. C. S. Ranasinghe supervised undergraduate research project of Ms. R. A. D. Pabasara Kumari, Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Dr. C. S. Ranasinghe supervised undergraduate research project of Ms. S. M. A. Oshadi Nadeeshani, Department of Plant Sciences, Rajarata University of Sri Lanka.

Dr. C. S. Ranasinghe supervised undergraduate research project of Mr. N. C. Peiris, Department of Plantation Management, Faculty of Agriculture and Plantation management, Wayamba University of Sri Lanka.

Dr. C. S. Ranasinghe supervised undergraduate research project of Ms. S. M. Sashika Priyadarshani Sinharali, Dept. of Export Agriculture, Faculty of Animal Sciences and Export Agriculture, Uwa Wellasa University of Sri Lanka.

Dr. N. P. A. D. Nainanayake supervised undergraduate research project of Mr. W. A. G. Chaturanga of the Faculty of Agriculture, University of Peradeniya.

Mr. M. D. P. Kumarathunge supervised undergraduate research project of Ms. D. S. Muthugala, Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka. Anuradhapura.

Mr. M. D. P. Kumarathunge supervised undergraduate research project of Ms. Ashvini Bulathsinhala, Department of Statistics and Computer Science, Faculty of Science, University of Peradeniya.

Mr. M. D. P. Kumarathunge supervised undergraduate research project of Ms. Dinesha Rajini, Department of Statistics and Computer Science, Faculty of Science, University of Peradeniya.

Dr. H. M. I. K. Herath supervised the final year research project of Ms. J. Wijesinghe, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka. The title of the project was the "Effect of coconut-based agroforestry systems on soil quality in the Intermediate Zone of Sri Lanka".

Dr. H. M. I. K. Herath supervised the final year research project of Ms. H. M. Silva, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka. The title of the project was the "Effect of cover crops on soil quality under coconut cultivation in the Intermediate Zone of Sri Lanka".

Dr. H. M. I. K. Herath supervised the final year research project of Ms. D. D. E. H. Ganga, Faculty of Plantation Management,

Wayamba University of Sri Lanka, Makandura. The title of the project was the "Performance of Eppawela Rock Phosphate with organic manure as a phosphate source for adult coconut palms in Dry Zone".

Dr. H. M. I. K. Herath supervised the industrial training programme of Ms. H. M. Silva, B.Sc. (Special) degree in Agricultural Science & Management, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Dr. H. M. I. K. Herath supervised the industrial training programme of Ms. J. Wijesinghe, B.Sc. (Special) degree in Agricultural Science & Management, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Ms. M. K. F. Nadheesha & Dr. N. A. Tennakoon supervised the final year research project of Mr. A. G. S. N. Jayaratne, Faculty of Agriculture & Plantation Management, Wayamba University of Sri Lanka, Makandura. The title of the project was the "Assessment of cadmium in inorganic fertilizer used in agriculture".

Dr. D. M. D. I. Wijebandara supervised undergraduate final year research project of Ms. U. H. Chamari Thilina Subhashinge de Silva, a student of Faculty of Agriculture, University of Rajarata on "Status of soil Boron in Coconut estates in Coconut triangle of Sri Lanka".

Dr. D. M. D. I. Wijebandara supervised undergraduate final year research project of Ms. J. P. Chathurangie Jayasinghe, a student of Faculty of Agriculture, University of Rajarata on "Copper and Zinc Nutrient Status of Coconut estates in Coconut Triangle of Sri Lanka".

Dr. D. M. D. I. Wijebandara supervised undergraduate final year research project of Ms. W. D. M. D. Weerasinghe, a student of Department of Plantation Management of the Wayamba University of Sri Lanka on "Dissolution of Eppawela Rock Phosphate in Dry Zone Coconut Growing Soils".

Served as Referees

Dr. L. Perera and Dr. S. A. C. N. Perera served as a reviewer for the Annual Sessions of the Department of Agriculture (ASDA).

Dr. C. S. Ranasinghe served as a referee for conference of Agricultural Sciences of the Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Dr. N. P. A. D. Nainanayake served as a referee for Tropical Agricultural Research and Extension Journal of University of Ruhuna, Sri Lanka.

Dr. N. P. A. D. Nainanayake served as a referee for the research publication of Young Scientists' Forum (YSF), Sri Lanka.

Dr. D. M. D. I. Wijebandara served as a referee for the Young Scientist Forum (YSF) of the National Science and Technology Commission (NASTEC).

Dr. I. M. S. K. Idrisinghe served as a referee to review 27 abstracts and five full papers to select best undergraduate research of the Annual Research Forum of Sri Lanka Agricultural Economics Association.

Invitation as Resource Speaker / Lecture

Dr. L. Perera delivered an invited lecture at the Annual General Meeting of the Coconut Growers Association of Sri Lanka on 'Breeding coconut for drought tolerance'.

Dr. S. A. C. N. Perera conducted a guest lecture at the Open University of Sri Lanka on 'Application of Molecular Techniques in Plant Breeding'.

Dr. C. S. Ranasinghe was invited as a resource speaker in the 46th APCC COCOTECH conference and coconut festival 2014, 7-11 July, Colombo, Sri Lanka. Dr. C. S. Ranasinghe was invited as a resource speaker in the Annual General Meeting of the Coconut Growers' Association, 19th July 2014, Colombo, Sri Lanka.

Served as Visiting Lecturers

Dr. H. T. R. Wijesekara and Dr. N. S. Aratchige served as visiting lecturers of Palm and Latex Technology degree course of Uva Wellassa University.

Dr. S. A. C. N. Perera served as a visiting lecturer at the Uva Wellassa University for the course on Coconut Breeding.

Dr. N. P. A. D. Nainanayake worked as a visiting lecturer in the course of Palm and Latex Technology in Uva Wellassa University.

Other Academic Activities

Dr. H. T. R. Wijesekara served as a rapporteur of two technical sessions conducted in the International Agricultural Research Symposium 2014, Sri Lanka Foundation, Colombo from 11 – 12 August 2014.

Dr. N. S. Aratchige served as a Judging Panel member at the Annual Congress of the Post Graduate Institute of Agriculture and Annual Symposium of the Rajarata University.

Dr. H. T. R. Wijesekara served as a member of the interview panel appointed for the viva voice examination of Palm and Latex Technology of Uva Wellassa University.

Dr. L. Perera served as a reviewer and an evaluator of project proposals, progress reports and project terminal reports of National Science Foundation (NSF) funded research projects.

Dr. L. Perera served as a reviewer and an evaluator of project proposals, progress reports of the Council for Agricultural Research Policy (CARP) funded research projects

Dr. L. Perera served as a rapporteur at the 5th Plantation Crop Research Symposium

Dr. L. Perera served as a Member of the Panel of Judges in the Biotechnology section of the Agriculture Research Symposium of the Wayamba University of Sri Lanka.

Dr. L. Perera and Dr. S. A. C. N. Perera acted as resource persons in developing the Global Coconut Conservation Strategy for 2015-2020. Coconut Genetic Resources Network (COGENT), Bioversity International.

Dr. S. A. C. N. Perera served as a reviewer and an evaluator of Project Proposals, Progress Reports of the Council of Agricultural Research Policy (CARP) funded projects.

Dr. S. A. C. N. Perera served as a reviewer for the International symposium organized by SLCARP.

Dr. S. A. C. N. Perera served as a reviewer for the Wayamba International Symposium WinC.

Dr. S. A. C. N. Perera served as a reviewer for the American Journal of Experimental Agriculture published by Science domain International.

Dr. S. A. C. N. Perera served as a reviewer for the British Journal of Applied Science and Technology published by Science domain International.

Dr. S. A. C. N. Perera served as a reviewer for the International Journal of Advance Agricultural Research published by Bluepen journals.

Dr. S. A. C. N. Perera served as a resource person at the Short Course in Plant Breeding conducted by the Open University of Sri Lanka.

Dr. H. M. I. K. Herath served as a reviewer in International Journals of Agricultural Water management, Agriculture and Environment and Environmental Science & Technology.

Dr. D. M. D. I. Wijebandara acted as an external examiner of the undergraduate viva-voice examination of 40 students of Palm and Latex Technology degree course of Uva Wellassa University of Sri Lanka.

Dr. D. M. D. I. Wijebandara participated as a resource person in training programme on "Nutrient Requirement of Oil Palm" for oil palm stakeholders meeting conducted by Coconut Research Institute.

Dr. D. M. D. I. Wijebandara participated as a resource person in Dayatakirula Exhibition at Kuliyapitiya.

Dr. D. M. D. I. Wijebandara participated as a resource person in two one day training programmes conducted by Coconut Research Institute

Dr. H. M. I. K. Herath participated as a resource person in training programme for Farm Planning officers of Coconut Cultivation Board on Land suitability Assessment for coconut held on 3rd Sep. 2014.

Dr. H. M. I. K. Herath participated as a resource person in one day training programmes conducted by Coconut Research Institute.

Dr. H. M. I. K. Herath participated as a resource person in training programme on Crop water use and irrigation for Diploma Students of National Institute of Plantation Management held 8th March 2014.

Ms. M. K. F. Nadheesha participated as a resource person in one day training programmes conducted by Coconut Research Institute.

Dr. I. M. S. K. Idirisinghe served as a member of panel of judges of the session on Plantation Management at the 13th AGRES of the Wayamba University of Sri Lanka held on 07th and 8th August 2014.

Dr. I. M. S. K. Idirisinghe served as an evaluator for the SLCARP to evaluate the research proposals for funding and for evaluation of project progress reports and presentations.

Dr. I. M. S. K. Idirisinghe acted as an external examiner of the M Phil viva-voice examination of Mr. W. H. D. Priyadarshana, Postgraduate Student of PGIA for the defense of the M. phil. thesis titled "Analysis of Transaction Cost in Production and Marketing of Potato and Red Onion in Sri Lanka".

Dr. I. M. S. K. Idirisinghe served as an evaluator for the National Science Foundation (NSF) to evaluate the research proposals for funding.

Mr. K. M. R. T. Wijekoon acted as an external examiner of the undergraduate viva-voice examination of 40 students of Palm and Latex Technology degree course of Uva Wellassa University of Sri Lanka.

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T. A. S. R. T. Thenuwara

M. M. T. Kumara

M. A. G. Pathiraja

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S. A. A. Viraj

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Librarian

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Mrs. S. N. Gunathilaka

Office Attendant

R. P. S. L. Abeyrathna

* Study Leave

** No pay Leave

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Mrs. H. M. A. Herath

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Mrs. U. I. Abeyasinghe

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P. G. P. S. Karunarathna

H. M. Jayathunga

K. D. L. Gunawardena

E. G. N. Bandara

H. M. D. N. Herath

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T. M. A. P. Kumarasinghe

S. H. A. M. Premarathna

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Office Attendant

J. K. Perera

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S. M. Sirisoma

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Miss. H. M. Mallikarachchi

Office Attendant

R. P. Nevil

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Senior Lab & Field Attendant

J. H. Premaratne

Lab & Field Attendant

H. A. C. P. Hettarachchi

Miss. R. M. S. S. Rathnayaka

Office Attendant

W. A. S. Jayathilake

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Y. P. D. S. Pathiraja, B.Sc. (Industrial Studies)

Management Assistant

D. M. Jayawardena

Lab & Field Attendant

J. C. P. Jayamanna

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H. M. Podiratne

Lab & Field Assistant

E. A. S. Kumara

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M. I. I. Miranda

Senior Pollination Labour

J. A. D. N. Stanly

Watcher

D. M. L. Jayarathna

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Lab & Field Attendant

H. J. M. P. Nilanga

H. A. A. S. Kumara

Office Attendant

W. G. Mallika Manike

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Lab & Field Attendant

Miss. K. P. A. Sanjeevani

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Assistant Superintendent

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WALPITA RESEARCH CENTRE

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S. A. S. Kumara

Watcher

S. M. U. D. Singhabahu

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Assistant Superintendent

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Management Assistant

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Senior Supervisor

A. G. B. G. Silva

Watcher

W. H. M. Wickramasinghe

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Supervisor

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Driver

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A. M. P. S. Abeyweera

Office Attendant

Mrs. P. M. Kamalawathie

General Worker

D. M. T. Sampath

PALLAMA GENETIC RESOURCE CENTRE

OIC

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Mrs. S. A. Sumanawathie

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K. G. Wasantha

Watcher

J. K. U. Abeyrathna

Senior Management Assistant

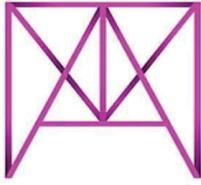
J. A. R. Reginold

Lab & Filed Attendant

Thabbowa Demonstration Farm

Lab & Field Attendant

H. M. C. Bandara



STAFF : RECRUITMENTS, RESIGNATIONS, RETIREMENTS, PROMOTIONS & TRANSFERS

Recruitments

Name	Designation	Date of appointment
J. A. S. Niroshan	Lab & Field Attendant	01.01.2014
S. M. R. C. Subasinghe	Lab & Field Attendant	01.01.2014
S. A. S. T. Raveendra	Research Officer	20.01.2014
Ms. H. M. H. N. K. Bandara	Research Officer	20.01.2014
Ms. D. M. P. D. Dissanayake	Research Officer	20.01.2014
Ms. H. P. D. T. Hewapathirana	Research Officer	20.01.2014
S. M. R. B. Subasinghe	Management Assistant (Store Keeper)	21.01.2014
Ms. L.L.W.C. Yalegama	Head/CPRD	08.05.2014
N.A. Tennakoon	Deputy Director (Research)	02.06.2014
K. A. N. P. W. Senadheera	Lab & Field Assistant	16.07.2014
S. M. T. R. Senaratne	Lab & Field Assistant	16.07.2014
C. W. S. P. Yapa	Lab & Field Assistant	16.07.2014
E. A. S. Kumara	Lab & Field Assistant	16.07.2014
M. D. M. Perera	Lab & Field Assistant	16.07.2014
W. M. M. Gihan	Lab & Field Assistant	16.07.2014
A.S. Nanayakkara	Assistant Director (Administration)	23.07.2014
L. B. S. Liyanage	Assistant Superintendent	01.08.2014
P. S. A. Wanasinghe	Assistant Superintendent	01.08.2014
Ms. R. P. D. Marasinghe	Management Assistant	01.09.2014
Nandakumar Jeyadharshan	Research Officer	03.11.2014
A.L.D.K. Amarasinghe	Resident Engineer	03.11.2014
M.P. Premaratne	PA to Director	03.11.2014
R. P. S. J. Manchanayake	General Worker	17.11.2014
D. M. T. Sampath	General Worker	17.11.2014
Y. P. D. S. Pathirajal	Assistant Superintendent	24.11.2014
P. E. Thusitha Kumara	Lab & Field Assistant	24.11.2014
J. R. L. D. Jayalath	Lab & Field Assistant	24.11.2014
H. M. H. P. Herath	Lab & Field Assistant	24.11.2014
Ms. C. A. N. Anthony	Lab & Field Assistant	24.11.2014
M. A. C. Udayasiri	Lab & Field Assistant	24.11.2014
T. M. N. Menaka	Field Supervisor	24.11.2014
K. G. Wasantha	Field Supervisor	24.11.2014
W. L. T. Liyanage	Field Supervisor	24.11.2014
M. K. M. Buddhika	Field Supervisor	24.11.2014
S. A. S. Kumara	Field Supervisor	24.11.2014

Name	Designation	Date of appointment
Ms. K. P. A. Sanjeevani	Lab & Field Attendant	24.11.2014
H. M. C. Bandara	Lab & Field Attendant	24.11.2014
S. N. Sanjeeva	Lab & Field Assistant	25.11.2014
Ms. E. M. A. Maduwanthi	Lab & Field Assistant	25.11.2014

Resignations

Name	Designation	Date
R. M. C. Prabhashana	Lab & Field Assistant	01.01.2014
Ms. M. A. D. W. S. Madurapperuma	Senior Research Officer	24.01.2014
J. R. K. Asanka	Assistant Chemical Engineer	31.01.2014
K. S. L. Karunaratne	Lab & Field Assistant	01.02.2014
T. M. P. A. K. Thilakarathne	Assistant Superintendent	25.04.2014
T. I. Miththaratne	Assistant Superintendent	25.04.2014
D. M. I. S. K. Dewameththa	Assistant Superintendent	11.07.2014
Ms. W. M. A. I. K. Weerapana	Technical Officer	29.08.2014
Ms. T. S. Wickramasinghe	Technical Officer	22.09.2014
M. S. Abeytissa	General Worker (Office Attendant)	30.09.2014
M. U. T. Jayamanna	Network Administrator	01.10.2014
J. K. U. Abeyratne	General Worker (Watcher)	02.10.2014
Ms. R. P. D. Marasinghe	Management Assistant	13.10.2014
S. A. D. W. Prinyankara	Assistant Seed Production & Certification Officer	31.12.2014

Retirements

Name	Designation	Date
Ms. H. D. Mangalika	Assistant Director (Administration)	02.01.2014
H. P. Ashoka Kumara	Lab & Field Assistant	20.02.2014
K. N. A. S. Perera	Resident Engineer	17.04.2014
K. J. S. Perera	Lab & Field Assistant	17.04.2014
Y. M. Chandrasiri	Lab & Field Attendant	07.05.2014
W. S. P. C. Fernando	Management Assistant (Accounting)	29.05.2014
W. A. L. R. Fernando	Management Assistant	14.06.2014
Ms. B. A. D. Kusumawathi	Lab & Field Attendant	24.06.2014
Ms. P. J. M. Fernando	Lab & Field Assistant	09.08.2014
Ms. P. C. A. Fernando	Administrative Officer	01.09.2014
H. A. Abeysona	Experimental Officer	06.09.2014
Ms. S. D. H. Bandara	Experimental Officer	23.09.2014
R. Vithanage	Technological Officer (Mechanical)	06.10.2014
F. H. A. J. R. Silva	Lab & Field Assistant	14.11.2014
D. P. Panditharatne	Experimental Officer	21.11.2014

Promotions

Non-Executive Grades & Executive Grades - Promotions were not made during the year 2014.

Transfers

Name & Designation	Place of Transfer	Date
Ms. H. M. W. S. Athauda Sr. Management Assistant (Stenography)	Technology Transfer Division to Estate Management Division	01.01.2014
Ms. D. T. D. Danapala Management Assistant	Technology Transfer Division to Agronomy Division	01.01.2014
P. D. Kathriarachchi Management Assistant	Agronomy Division to Technology Transfer Division	01.01.2014
H. K. Prasanna Sr. Lab & Field Attendant	Tissue Culture Division to Agronomy Division	01.01.2014
Ms. M. S. M. Dharmarathne Lab & Field Attendant	Soils & Plant Nutrition Division to Tissue Culture Division	01.01.2014
T. A. S. R. P. Thenuwara Lab & Field Attendant	Agronomy Division to Genetics & Plant Breeding Division	01.01.2014
R. K. M. S. N. Rajapaksha Lab & Field Attendant	Coconut Processing Research Division to Crop Protection Division	01.01.2014
H. M. G. Jayawardena Lab & Field Attendant	Genetics & Plant Breeding Division to Coconut Processing Research Division	01.01.2014
W. R. P. Tissera Lab & Field Attendant	Crop Protection Division to Soils & Plant Nutrition Division	01.01.2014
J. A. R. Malintha General Worker (Office Attd.)	Establishment Unit to Plant Physiology Division	01.01.2014
Ms. S. H. M. Chandrawathi General Worker (Office Attd.)	Plant Physiology Division to Establishment Unit	01.01.2014
Ms. A. M. J. N. Arthanayake Lab & Field Attendant	Establishment Unit to Plant Physiology Division	01.01.2014
Ms. T. S. Abeyrathne Lab & Field Attendant	Crop Protection Division to Establishment Unit	01.01.2014
M. D. P. Kumarathunge Research Officer	Biometry Unit to Plant Physiology Division	16.01.2014
Ms. W. N. M. Fermamdo Lab & Field Assistant	Pottukulama Researchn Centre to Bandirippuwa Research Centre	01.02.2014
A. G. B. G. Silva Sr. Field Supervisor	Bandirippuwa Research Centre to Pottukulama Research Centre	01.02.2014
W. W. A. P. R. Fernando Sr. Field Supervisor	Pallama Genetic Resource Centre to Pottukulama Research Centre	01.02.2014
A. A. Sirinimal Sr. Field Supervisor	Bandirippuwa Research Centre to Ambakelle Genetic Resource Centre	01.02.2014
W. K. M. K. Herath Technical Officers	Biometry Unit to Plant Physiology Division	01.03.2014
Ms. U. I. Abeysinghe Sr. Management Assistant	Biometry Unit to Establishment Unit	01.03.2014

Name & Designation	Place of Transfer	Date
A. A. Sirinimal Sr. Field Supervisor	Ambakelle Genetic Resource Centre to Maduru Oya Genetic Resource Centre	23.04.2014
Ms. J. A. K. M. Fernando Assist. Mechanical Engineer	Coconut Processing Research Division to Dunkannawa Coir Research Centre	21.04.2014
W. M. D. R. Wijesinghe Field Supervisor	Ratmalagara Research Centre to Pallama Genetic Resource Centre	10.07.2014
J. M. C. P. Jayamanna Lab & Field Attendant	Pottukulama Research Centre to Ratmalagara Research Centre	15.08.2014
S. M. U. D. Sinhabahu General Worker (Watcher)	Pallama Genetic Resource Centre to Walpita Research Centre	01.08.2014
I. A. N. Hemasiri Estate Superintendent	Walpita Research Centre to Pottukulama Research Centre	01.10.2014
G. B. A. Wijesekera Estate Superintendent	Ratmalagara Research Centre to Dunkannawa Research Centre	01.10.2014
S. A. S. Kumara Field Officer (Contract)	Dunkannawa Research Centre to Walpita Research Centre	01.10.2014
L. S. B. Liyanage Asst. Estate Superintendent	Bandirippuwa Research Centre to Dunkannawa Research Centre	01.10.2014
J. H. Premaratne Sr. Lab & Field Attendant	Coconut Processing Research Division to Bandirippuwa Research Centre	01.12.2014
Ms. W. N. M. Fernando Lab & Field Attendant	Bandirippuwa Research Centre to Coconut Processing Research Division	03.12.2014

STATEMENT OF FINANCIAL PERFORMANCE

FOR THE YEAR ENDED 31ST DECEMBER 2014

		2014 APPROVED	2014	2013
	NOTES	BUDGET	ACTUAL	ACTUAL
		Rs.	Rs.	Rs.
<u>OPERATING REVENUE</u>				
TRANSFERS FROM OTHER GOVERNMENT ENTITIES	03	187,000,000.00	179,662,000.00	163,260,000.00
GENETIC & RESEARCH CENTER REVENUE	04	156,826,000.00	202,912,157.27	159,759,747.35
OTHER REVENUE	05	15,000,000.00	95,427,816.09	88,606,958.97
TOTAL REVENUE		<u>358,826,000.00</u>	<u>478,001,973.36</u>	<u>411,626,706.32</u>
<u>OPERATING EXPENCES</u>				
WAGES SALARIES AND EMPLOYEES' BENEFITS	06	150,225,000.00	141,733,582.44	130,038,985.25
SUPPLIES & CONSUMABLES USED	07	38,175,000.00	47,251,835.89	41,332,915.82
DEPRECIATION & AMORTISATION EXPENCES	10		21,979,244.66	23,605,629.46
GENETIC & RESEARCH CENTER EXPENCES	04	118,539,000.00	135,108,145.31	116,393,347.96
RESEARCH & DEVELOPMENT EXPENCES WRITE OFF	08		40,684,896.28	36,476,417.31
OTHER EXPENCES	09	13,600,000.00	20,753,021.51	23,077,267.56
TOTAL EXPENCES		<u>320,539,000.00</u>	<u>407,510,726.09</u>	<u>370,924,563.36</u>
		38,287,000.00	70,491,247.27	40,702,142.96

The Accounting Policies on page 05 to 15 and Notes on pages 16 to 24 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

SHORT ANNUAL REPORT - 2014

STATEMENT OF FINANCIAL POSITION

AS AT 31ST DECEMBER 2014

	NOTES	2014 APPROVED BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
<u>NON CURRENT ASSETS</u>				
INFRASTRUCTURE PLANT & EQUIPMENT	10	144,413,000.00	1,953,800,559.96	1,933,553,945.10
BIOLOGICAL ASSETS	11		8,821,092.50	7,002,262.50
OTHER NON FINANCIAL ASSETS	12	23,874,000.00	2,750,561.18	2,749,377.18
OTHER NON CURRENT ASSETS	13		13,175,763.16	13,913,280.00
		168,287,000.00	1,978,547,976.80	1,957,218,864.78
<u>CURRENT ASSETS</u>				
CASH & CASH EQUIVALANTS	14		57,720,541.85	15,357,861.77
RECIEVABLES	15		21,444,242.15	16,404,877.67
INVENTORIES	16		80,190,616.68	65,449,501.51
PREPAYMENTS	17		300,145.50	498,434.57
OTHER CURRENT ASSETS	18		33,204,816.57	21,536,899.99
		-	192,860,362.75	119,247,575.51
TOTAL ASSETS		168,287,000.00	2,171,408,339.55	2,076,466,440.29
<u>LIABILITIES</u>				
<u>CURRENT LIABILITIES</u>				
PAYABLES	19		38,922,310.02	14,609,075.32
EMPLOYEE BENEFITS	20		105,512,659.96	99,824,533.42
			144,434,969.98	114,433,608.74
<u>NON CURRENT LIABILITIES</u>				
CAPITAL CONTRIBUTED BY DONOR FUNDED PROJECTS	21		17,881,538.42	16,982,263.67
		-	17,881,538.42	16,982,263.67
TOTAL LIABILITIES		-	162,316,508.40	131,415,872.41
NET ASSETS		168,287,000.00	2,009,091,831.15	1,945,050,567.88
<u>NET ASSETS/EQUITY</u>				
CAPITAL CONTRIBUTED BY THE OTHER GOVERNMENT ENTITIES		130,000,000.00	393,182,052.40	395,826,583.08
RESERVES			1,689,612,302.64	1,689,612,302.64
ACCUMULATED SURPLUS/(DEFECIT)		38,287,000.00	(73,702,523.89)	(140,388,317.84)1,
		168,287,000.00	2,009,091,831.15	945,050,567.88
TOTAL NET ASSETS/EQUITY		168,287,000.00	2,009,091,831.15	1,945,050,567.88

The Accounting Policies on page 05 to 15 and Notes on pages 16 to 24 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

CASH FLOW STATEMENT

FOR THE YEAR ENDED 31ST DECEMBER

	2014	2013
	<u>Rs.</u>	<u>Rs.</u>
CASH FLOW FROM OPERATING CTIVITIES		
SURPLUS/(DEFICIT)	70,491,247.27	40,702,142.96
NON-CASH MOVEMENTS		
DEPRECIATION & AMORTIZATION	33,666,401.23	40,711,986.77
ASSETS & RESEARCH EXPENSE WRITE OFF	(69,484,530.68)	(68,740,448.17)
INCREASE IN PROVISION FOR DOUBTFUL DEBTS		
INCREASE/(DECREASE) IN PAYABLES	24,313,234.70	(6,006,840.27)
INCREASING IN BORROWING		
INCREASE IN PROVISIONS RELATING TO EMPLOYEE COSTS	19,931,296.39	13,518,949.35
EMPLOYEE GRATUITY PAYMENT	(14,243,169.85)	(13,348,760.48)
(GAINS)/LOSSES ON SALE OF PROPERTY, PLANT & EQUIPMENT	(779,812.73)	(8,424,659.27)
(GAINS)/LOSSES ON INVESTMENTS		
INCREASE IN OTHER CURRENT ASSETS	(7,457,018.13)	26,524,070.58
INCREASE IN INVESTMENT DUE TO REVALUATION		
INCREASE IN INVENTORIES	(14,741,115.17)	(10,008,969.02)
INCREASE IN RECEIVABLES	(5,633,364.48)	(8,401,120.79)
LESS:- PRIOR YEAR PROFIT ADJUSTMENT	(3,805,453.32)	118,468.18
NET CASH FLOW FROM OPERATING ACTIVITIES	<u>32,257,715.23</u>	<u>6,644,819.84</u>
CASH FLOW FROM INVESTING ACTIVITIES		
PURCHASE OF PLANT & EQUIPMENT TREASURY FUND	(54,226,879.35)	(80,985,106.68)
PURCHASE OF PLANT & EQUIPMENT DONOR FUND	899,274.75	1,497,512.00
PURCHASE OF LIBRARY BOOKS & PERIODICALS	(1,184.00)	(104,608.00)
PURCHASE / SALE OF BIOLOGICAL ASSETS	(1,818,830.00)	2,712,142.50
PROCEEDS FROM SALE OF PLANT & EQUIPMENT	1,093,675.99	5,141,136.00
CASH IN OTHER NON CURRENT ASSETS	8,025,616.84	
INCREASE IN OTHER NON CURRENT ASSETS	(7,288,100.00)	
INTEREST ON INVESTMENT	594,000.00	
INVESTMENT IN FIXED DEPOSIT	(15,000,000.00)	
NET CASH FLOW FROM INVESTING ACTIVITIES	<u>(67,722,425.77)</u>	<u>(71,738,924.18)</u>
CASH FLOW FROM THE FINANCING ACTIVITIES		
PROCEEDS FROM BORROWING		
TREASURY CAPITAL GRANT	66,840,000.00	62,740,000.00
DONOR FUNDED PROJECTS CAPITAL GRANT		519,989.28
RESEARCH & DEVELOPMENT AND ASSETS WRITE OFF		
REPAYMENTS OF BORROWING		
DISTRIBUTION / DIVIDENDS TO GOVERNMENT		
NET CASH FLOWS FROM THE FINANCING ACTIVITIES	<u>66,840,000.00</u>	<u>63,259,989.28</u>
NET INCREASE / (DECREASE) IN CASH & CASH EQUIVALENTS	31,375,289.46	(1,834,115.06)
CASH & CASH EQUIVALENTS AT BEGINNING OF PERIOD	26,345,252.39	28,179,367.45
CASH & CASH EQUIVALENTS AT END OF PERIOD	<u>57,720,541.85</u>	<u>26,345,252.39</u>

STATEMENT OF CHANGES IN NET ASSETS/EQUITY

NOTE	CAPITAL CONTRIBUTED BY THE GOVERNMENT	REVALUATION RESERVE	ACCUMULATED SURPLUS/DEFICIT	TOTAL EQUITY
BALANCE AS AT 31-12-2013	404,484,984.48	1,689,612,302.64	(145,036,018.73)	1,949,061,268.39
BAD DEBTS FOR THE YEAR 2013			(91,125.00)	(91,125.00)
ASSETS WRITE OFF (CSS) FOR THE YEAR 2013			(3,917,167.08)	(3,917,167.08)
INTEREST ON FD 2012/2013 (FOR FIVE MILLION)			1,155,483.08	1,155,483.08
STOCK VARIANCE 2013 (CSS)			(930,510.00)	(930,510.00)
ASSETS WRITE OFF 2013	(8,647,553.19)		8,647,553.19	-
PREVIOUS YEAR ACCOUNTING ERROR OF AC/NO 1528	(10,848.21)		(916,533.30)	(927,381.51)
BAD DEBTS OVER PROVISION IN 2013 (LAND/MSG)			700,000.00	700,000.00
RESTATED BALANCE AS AT 01-01-2014	395,826,583.08	1,689,612,302.64	(140,388,317.84)	1,945,050,567.88
CAPITAL GRANT - TREASURY	66,840,000.00			66,840,000.00
SURPLUS/DEFICIT FOR THE YEAR			70,491,247.27	70,491,247.27
INTEREST INCOME FOR 2013 (FOR 6 MILLION)			17,950.55	17,950.55
PF ARREARS			(3,823,403.87)	(3,823,403.87)
ASSETS WRITE OFF CURRENT YEAR	(28,799,634.40)			(28,799,634.40)
RESEARCH AND DEVELOPMENT EXP. WRITE OFF	(40,684,896.28)			(40,684,896.28)
BALANCE AT DECEMBER 31, 2014	393,182,052.40	1,689,612,302.64	(73,702,523.89)	2,009,091,831.15

Significant Accounting Policies

1. General

- 1.1. 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 head quarters 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.
- 1.2. 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.
- 1.3. Principal Activities and Nature of Operations.
 - Ø Conduct further scientific research on growth and cultivation of coconut palm, growing other crops and prevent & cure of diseases.
 - Ø Conduct further scientific research on coconut processing , utilization of coconut products and value addition.
 - Ø Establish and maintain pilot plants for processing of coconut products and fabricate coconut processing equipment.
 - Ø Establish and maintain institutes' seed gardens and experimental stations.
 - Ø Train advisory and extension workers to assist the coconut industry.

General Policies

1.4. Statement of Compliance

Statement of financial position , Statement of financial performances, Statement of changes in net assets/ equity, Cash flow 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 .

1.5. Basis of Preparation

The financial statements presented in Sri Lanka rupees have been prepared on a historical cost basis.

1.6. 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 relevant to reflect the changes in the provisions of these SLPSAS.

The adoption of the new standards have 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 Statement

SLPSAS - 03 Accounting Policies, Changes in Accounting Estimates
& Errors Statements

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

1.7. 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.

1.8. 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.

1.9. Foreign Currency Translation.

The Financial Statements are prepared in Sri Lanka rupees which is the institute functional and presentation currency.

1.10. Tax

The Board is not liable to Tax in the current year under the provisions of the Inland Revenue Act.

1.11. 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 using a straight-line method on the cost or valuation of all Infrastructure Plant & Equipment, other than freehold land, in order to write off such amounts over the estimated useful economic life of such assets.

The estimated useful life of assets are as follows:

<u>Assets</u>	<u>Years.</u>
Buildings	25
Machinery & Laboratory Equipments	10
Field equipments	10
Vehicles	05
Office & Computer Equipments	05
Other Equipments	05
Furniture, fittings & Fixtures	20

No depreciation is charged on Lands and on leased lands. On the other assets full depreciation is charged in the year of disposal and no depreciation in the year of purchase.

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 Development Authority decided to allocate land known as Dunkannawa Estate which was leased to Coconut Research Institute period of thirty (30) years commencing from 1st May, 2001 and ending 30th April, 2031 and annual rental of Rs.30,000 (Thirty Thousand) during the 1st year and thereafter with an annual rental increased by ten per cent (10%) per annum.

1.12.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%

1.13. 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 stock are valued base on the National Live stock Development Board rates which is authorized institute of the live stock.

1.14. 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.

1.15. Inventories

Inventories 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. The cost incurred in ;

bringing inventories to its present location and condition is accounted for as follows:

Ø Nuts	Subsequent realised value
Ø Copra	Net sales average
Ø Fertilizer	First in first out
Ø Publications	Subsequent realised value
Ø Chemical & Glassware	First in first out
Ø Seedling Product	Subsequent realised value
Ø General Store Stock	First in first out
Ø Other stocks	Subsequent realised value

1.16. 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. Full provision has been made for irrecoverable debtors. 10% provision is on other Debtors.

1.17. Cash and Cash Equivalent

Cash and Cash Equivalents in the cash Flow Statement comprise, cash at bank and in hand and short term deposits

1.18. Books and Periodicals.

he stocks of books & periodicals has been valued and disclosed in the accounts.The previous practice was total book & periodicals expenditure incurred on the purchase of items during the year under review had been charged against the income.

1.19. Liabilities and Provisions

Gratuity is a defined benefit plan. The institute is liable to pay gratuity in terms of the relevant statutes. In order to meet this liability, a provision is carried forward in the statement of financial position, based on a half month's salary as of the last month of the financial year, for all employees for each completed year of service, commencing from the first year of service. 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.

However, as per the payment of gratuity Act No. 12 of 1983, the liability to an employee arises only on completion of 05 years of continued service.

The gratuity liability is neither externally funded nor actuarially valued.

1.20. 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

1.21. Revenue Recognition.

- i) The total 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.

1.22. Expenditure Recognition.

Expenditure are 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.

1.23. 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 years 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
- Oil Palm Research

The previous practice was total Research and Development expenditure disclose as assets of the Balance Sheet and the presently these expenses during the year under review have been charged against the Statement of Financial Performance.

Note 04**GENETIC RESOURCE CENTER & RESEARCH CENTER (ESTATES) REVENUE & EXPENDITURE**

	BANDIRIPPUWA	RATHMALA-	AMBAKELLE	POTTHUKULAMA	WALPITA	MAKANDURA	MADURUOYA	PALLAMA	DUNKANAWA	ESTATE	TOTAL	BUDGET	TOTAL
	RESEARCH	RESEARCH	GENETIC RESOURCE	RESEARCH	RESEARCH	GENETIC RESOURCE	GENETIC RESOURCE	GENETIC RESOURCE	RESEARCH	MANAGEMENT	2014	2014	2013
	STATION	CENTER	CENTER	CENTER	CENTER	CENTER	CENTER	CENTER	CENTER	DIVISION	2014	2014	2013
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
REVENUE													
SALES OF COCONUT	22,277,703.76	16,614,824.88	50,357,022.15	16,964,185.03	3,121,657.44	14,179,265.99	22,976,803.03	17,278,019.52	1,800,561.66	1,992,281.78	167,562,325.24	127,987,000.00	126,319,366.20
SALES OF COPRA	516,908.50	291,850.40	149,625.25	1,096,259.75	55,716.00	303,195.70		386,329.50			2,799,885.10	2,062,000.00	4,185,654.40
SALES OF SEEDLING	250.00	821,225.00	3,365,129.30		517,350.00	613,725.00	271,825.00	2,587,125.00	1,682,650.00	1,260,875.89	11,120,155.19	13,558,000.00	9,825,365.95
SALES OF SUNDRIES	2,016,604.46	623,933.97	280,845.53	462,337.64	87,249.52	520,158.91	87,726.70	699,108.21	140,756.36	70,494.54	4,989,215.84	9,415,000.00	4,051,815.61
SALE OF ANIMALS PRODUCE & ANIMALS	496,739.22	201,070.60	363,371.00	186,649.94		16,080.00	130,806.00	303,068.00			1,697,784.76	3,804,000.00	6,828,008.40
FD INTEREST INCOME										1,305,014.00	1,305,014.00		1,155,483.08
TOTAL REVENUE	25,308,205.94	18,552,904.85	54,515,993.23	18,709,432.36	3,781,972.96	15,632,425.60	23,467,160.73	21,253,650.23	3,623,968.02	4,628,666.21	189,474,380.13	156,826,000.00	152,365,693.64
STOCK VARIANCES													
STOCK AS AT 01-01-2014	4,228,288.28	4,671,647.29	10,987,607.58	5,419,071.88	1,106,243.56	3,746,975.66	6,680,116.55	5,299,303.21	699,237.00	907,890.00	43,746,381.01		36,352,327.30
STOCK AS AT 31-12-2014	3,923,670.50	7,271,074.05	10,580,205.50	8,050,370.80	1,321,082.50	3,852,867.90	7,302,852.90	10,208,825.00	2,650,640.00	2,022,569.00	57,184,158.15		43,746,381.01
	(304,617.78)	2,599,426.76	(407,402.08)	2,631,298.92	214,838.94	105,892.24	622,736.35	4,909,521.79	1,951,403.00	1,114,679.00	13,437,777.14		7,394,053.71
ESTATE REVENUE	25,003,588.16	21,152,331.61	54,108,591.15	21,340,731.28	3,996,811.90	15,738,317.84	24,089,897.08	26,163,172.02	5,575,371.02	5,743,345.21	202,912,157.27	156,826,000.00	159,759,747.35
GENERAL CHARGES	4,363,093.01	5,247,114.49	7,949,524.94	3,777,003.92	1,180,630.89	3,095,201.30	4,857,486.11	5,387,506.02	719,153.49	15,484,514.97	52,061,229.14	45,219,000.00	39,120,133.08
STAFF SALARIES	4,404,126.24	2,353,528.21	5,118,669.48	2,310,273.67	661,007.35	2,578,976.21	1,798,841.96	2,523,234.47	616,869.99	3,587,947.60	25,953,475.18	18,766,000.00	22,271,273.09
UPKEEP	2,381,227.30	1,959,674.14	7,650,133.41	586,586.43	321,331.58	2,216,455.58	828,110.22	5,259,958.23	2,822,784.87	1,211,789.56	25,238,051.32	20,310,000.00	13,945,352.22
CULTIVATION	1,644,438.03	1,101,375.35	2,281,763.63	824,744.02	247,907.09	716,701.06	938,690.57	551,230.10	120,057.07	225,834.51	8,652,741.43	13,760,000.00	11,051,626.03
HARVESTING	2,564,971.64	1,108,173.80	1,921,542.79	1,453,901.84	281,574.88	637,198.45	1,142,473.61	1,681,051.17	57,380.25	40,480.74	10,888,749.17	8,635,000.00	8,933,791.49
DEPRECIATION	99,649.74	528,701.79	436,010.91	308,895.26	136,357.72	254,392.20	219,380.94	230,022.46	98,182.55	153,229.35	2,464,822.92		5,269,559.47
TOTAL COST OF PRODUCT.	15,457,505.96	12,298,567.78	25,357,645.16	9,261,405.14	2,828,809.51	9,498,924.80	9,784,983.41	15,633,002.45	4,434,428.22	20,703,796.73	125,259,069.16	106,690,000.00	100,591,735.38
CURING INTO COPRA/DISPOSE	435,965.01	277,068.69	99,415.65	371,919.78	37,027.83	198,850.35	70,837.01	164,754.03	18,040.48	19,986.05	1,693,864.88	679,000.00	1,559,688.28
ANIMAL HUSBANDRY	754,088.48	232,699.29	643,386.42	703,705.16	6,650.00	62,255.92	332,766.52	456,659.66	3,035.00	217,692.62	3,412,939.07	3,120,000.00	4,316,238.92
COST OF SEEDLING												8,050,000.00	6,736,440.73
AMORTIZATION	572,331.59	93,159.81	315,343.59	202,018.51	57,620.94	113,536.96	66,624.16	1,489,933.17	136,021.26	1,695,682.21	4,742,272.20		3,189,244.65
TOTAL EXPENDITURE	17,219,891.04	12,901,495.57	26,415,790.82	10,539,048.59	2,930,108.28	9,873,568.03	10,255,211.10	17,744,349.31	4,591,524.96	22,637,157.61	135,108,145.31	118,539,000.00	15,801,612.58
NET SURPLUS/(DEFICIT)	7,783,697.12	8,250,836.04	27,692,800.33	10,801,682.69	1,066,703.62	5,864,749.81	13,834,685.98	8,418,822.71	983,846.06	(16,893,812.40)	67,804,011.96	38,287,000.00	43,366,399.39
Less :- Head Office Administration Expences											8,000,000.00		
Profit Bonus to Estate Staff											2,951,557.00		
											<u>78,755,568.96</u>		

Notes to the Financial Statements

As at 31 December

	2014 BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
Note 03 TRANSFERS FROM OTHER GOVERNMENT ENTITIES			
RECURRENT GRANT	187,000,000.00	179,662,000.00	163,260,000.00
	187,000,000.00	179,662,000.00	163,260,000.00

2014 BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
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Note 05 OTHER REVENUE

INTEREST ON LOAN & INVESTMENT	600,000.00	812,888.92	833,625.74
INCOME FROM MOTOR VEHICLES	750,000.00	367,833.17	805,056.78
SUNDRY INCOME	13,450,000.00	9,364,487.10	12,676,991.71
SALES CENTER INCOME		1,588,214.30	2,748,875.02
SALES OF PHEROMONE	150,000.00	462,330.00	373,210.00
SALES OF MONOCROTOPHOSE	50,000.00	27,040.00	23,015.00
INCOME PROJECTS		13,320,491.92	2,416,584.76
RESEARCH & DEVELOPMENT WRITE OFF		40,684,896.28	36,476,417.31
ASSETS WRITE OFF		28,799,634.40	32,253,182.65
	15,000,000.00	95,427,816.09	88,606,958.97

2014 BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
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Note 06 WAGES SALARIES AND EMPLOYEES' BENEFITS

SALARIES ALLOWENCES & OVER TIME	117,525,000.00	107,642,621.35	97,528,536.76
BOARDS CONTRIBUTION TO ETF/EPF	19,200,000.00	13,597,274.97	15,961,574.38
BOARDS CONTRIBUTION TO MEDICAL AID	6,000,000.00	4,654,833.63	4,812,370.35
COCONUT ALLOWANCES	500,000.00	855,278.18	576,139.95
GRATUITY	7,000,000.00	14,983,574.31	11,160,363.81
	150,225,000.00	141,733,582.44	130,038,985.25

2014 BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
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Note 07 SUPPLIES AND CONSUMABLES USED

SUPPLIERS AND CONSUMABLES	10,315,000.00	14,790,343.64	13,148,726.38
CONTRACTUAL SERVICES	16,800,000.00	9,324,899.54	8,950,433.17
MAINTENANCE	11,060,000.00	23,136,592.71	19,233,756.27
	38,175,000.00	47,251,835.89	41,332,915.82

Note 08

RESEARCH & DEVELOPMENT EXPENCES WRITE OFF

Description (Thrust Area)	CODE	WRITE OFF YEAR 2014	WRITE OFF YEAR 2013
(1) Crop Protection			
1.1 Crop Protection Division			
Diseases	259	298,084.17	76,897.60
Protection services	260	1,740,716.42	1,031,787.07
Waligama Leaf Wilt Disease	287	1,099,884.16	6,418,311.23
Maintenance of Predator Lab	289	791,436.04	784,001.58
Plesisps Beetle	290	175,037.50	66,688.80
		4,105,158.29	8,377,686.28
(2) Crop Production			
2.1 Agronomy Division			
Soil Moisture Conservation	261	192,495.69	219,060.83
Low Yielding Palms	262	538,843.93	431,649.40
Farming System	263	556,096.28	484,477.80
Bio-energy Production	264	690,121.10	797,691.73
Inter Cropping	265	829,068.14	244,983.03
Weed Management	266	492,389.57	268,352.22
Poverty Alleviation Studies	267		24,477.00
Animal Husbandry	268	606,306.35	568,387.09
Vermi Culture	269	128,512.54	98,040.40
Coconut Planting Systems	270	356,093.10	347,738.74
Organic Farming	271	152,299.80	95,684.06
		4,542,226.50	3,580,542.30
2.2 Oil Farm			
Oil farm research	291	139,033.96	166,423.35
Land Suitability Assessment	292	41,535.28	108,933.65
Land & Fie Id Management	293	76,150.50	58,161.50
Genetic Improvement	294	57,281.25	86,711.71
Clonel Sudies	295	27,565.50	44,788.40
Soil & Fertilizer Studies	296	278,129.67	134,985.85
Environment Physiology Studies	297	275.00	13,505.16
Pest & Diseases Management	298	54,545.38	33,484.42
Processing Studies	299		19,936.25
Socio-Economic Studies	300	13,600.00	4,586.00
		688,116.54	671,516.29
2.2 Soil & Plant Nutrition Div.			
Low cost Material	272	619,346.38	646,710.74
Fertilizer Mixture	273	858,750.49	360,818.18
D.F.R.	274	271,700.50	621,493.25
Micronutrients	275	270,387.70	544,415.71
Irrigation	277		673,862.94
Nutrient Mapping	278	292,905.10	274,380.17
Organic Manure	279	280,512.67	364,480.79
Land suitability assesment	288	2,090,741.42	2,322,109.40
		4,684,344.26	5,808,271.18
(3) Crop Improvement - GPBD			
Eval. Exis. Co. Cultivars	280	186,695.28	1,015,070.99
Dev. New co. Cultivars	281	1,690,449.42	685,668.07
Conse. Eva. Co. Germplasm	282	796,548.14	1,305,214.09
Tolerance to Aceria mite	283	441,808.00	1,694,131.00
		3,115,500.84	4,700,084.15

Note 08 RESEARCH & DEVELOPMENT EXPENCES WRITE OFF

Description (Thrust Area)	CODE	WRITE OFF YEAR 2014	WRITE OFF YEAR 2013
(4) Coconut Processing - CPRD			
Improv.Kernal Based Product	225	90,362.27	228,779.40
Sap Based Product	226	283,369.88	158,415.99
Charcol making Process	227	97,911.00	357,061.09
Testing of Abrasive Feeling Machanism	228		5,630.00
Project on Coconut Oil	255	376,158.97	1,374,531.77
Project on Product Develop.	256	383,127.92	200,023.30
		1,230,930.04	2,324,441.55
(5) Agriculture Economics			
Socio Economy Studies	286	1,158,168.96	718,233.09
		1,158,168.96	718,233.09
(6) Development & Services Related to Crop Production			
Drought Study- Middeniya (ppd)	400	1,048,267.28	582,707.38
Formulation of an Effective Fertilizer Mix.Young Coco.	430	1,575.00	-
Use of locally K sources as Fertilizer for coconut(Bio)	431	555,597.85	523,706.00
Improv. of soil Ferti.coco. Land Through Vermiculture	446	-	-
		1,605,440.13	1,106,413.38
(7) Development & Services Activities Related to GeneticalImprovement of Coconut (Gpb)			
Construction of a Coconut Genome map	411	261,031.74	492,341.03
Constr. Of a Population for Mpping QTL Acaria Mite	412	237,592.80	-
Molecular Diagnosis of coco. Disorders	413	31,410.41	-
Estab. P.S.G. for mass Production of CRISL98	414	755,757.91	378,517.71
Upgrading ISG to Increase the Produ. Of CRIC 65	415	572,030.14	449,719.97
Germplasm Importation	416	415,986.90	-
Function of the Seed Production Unit	417	2,606,449.76	3,301,145.84
Estab. Seed Garden for mass Produ. Of Kapruwana	432	-	-
		4,880,259.66	4,621,724.55
(8) Development & Services Related to Crop Protection			
Coconut Mite Research & Development (Cpd)	418	271,854.15	399,914.25
Extension Programs for Mite Management	419	1,462.00	-
Manag. Of black beetal using pherom. & Oryctes(Cpd)	433	120,578.00	202,454.00
		393,894.15	602,368.25
(9) Development & Services Related to Coconutprocessing & Value Addition (cprd)			
Dev.& Impro. Co. coir retting thro. Intrudu.Cons. Micro	423	2,961,811.26	409,217.76
Dev.& Impro. Coconut fibre based Products	424		43,218.57
Dev. Prod. Of high qua. Charcoal & Copra	425	755.00	84,457.00
		2,962,566.26	536,893.33

Note 08 RESEARCH & DEVELOPMENT EXPENCES WRITE OFF

Description (Thrust Area)	CODE	WRITE OFF YEAR 2013	WRITE OFF YEAR 2012
(10) Development & Services Related to Coconut processing & Value Addition			
Develop. Farm machinery for coconut sector (cprd)	435	201,872.42 201,872.42	179,002.88 179,002.88
(11) Agricultural Economics			
Mechanization & the demand of machnery co. Indus.	438	42,867.47 42,867.47	58,378.47 58,378.47
(12) Transfer of Technology			
Coconut Technology Village	426	2,019,324.38	1,250,517.58
Eletronic print media & Techn. transfer Prog (ext)	441	7,111,172.92	804,517.20
Development of field models & exhibits (ext)	442	237,784.00	322,762.65
Farmer field school Expansion (ext)	443	1,090,844.85	33,244.83
Impro. farm practies in mini coco. Trangle Hambantota (ext)	444	614,424.61	779,819.35
		11,073,550.76	3,190,861.61
TOTAL		40,684,896.28	36,476,417.31

Note 09

	2014 BUDGET Rs.	2014 ACTUAL Rs.	2013 ACTUAL Rs.
OTHER EXPENSES			
TRAVELLING	1,575,000.00	646,087.91	1,650,979.75
EXPENSES - PROJECTS		9,001,471.06	4,994,185.91
EXPENSES - CESS		3,955,828.05	7,627,482.00
BOARD MEMBERS FEES	325,000.00	297,340.00	290,950.00
WELFARE	2,000,000.00	1,906,632.18	1,431,602.36
OTHER OPERATING EXPENSES	9,700,000.00	4,945,662.31	7,082,067.54
	13,600,000.00	20,753,021.51	23,077,267.56

Notes to the Financial Statements (Contd)

As at 31 December

Note 10 - INFRASTRUCTURE PLANT & EQUIPMENT

	MATURED LAND	BUILDINGS	IMPROVEMENT TO ESTATES	FIELD, AUDIO, WATER & LABORATORY EQUIPMENTS	VEHICLES	OFFICE , ENGERING, NETWORK, COMPUTER AND OTHER EQUIPMENT	OFFICE & BUNOW FURNITURE, FITTINGS & FIXTURES	TOTAL 2014	TOTAL 2013
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
<u>COST</u>									
AS AT 01 -01-2013	1,522,283,873.98	210,596,656.84	94,845,444.02	191,661,270.76	76,210,797.85	52,064,084.38	25,779,956.86	2,173,442,084.69	2,108,326,410.79
ADDITIONS		10,056,688.85	12,205,281.65	25,483,534.24	4,065,099.52	6,152,115.18	435,119.94	58,397,839.38	74,156,856.79
DISPOSALS		-	-	1,409,090.99	432,235.00	2,058,599.00	298,283.50	4,198,208.49	9,069,182.89
AS AT 31-12-2013	1,522,283,873.98	220,653,345.69	107,050,725.67	215,735,714.01	79,843,662.37	56,157,600.56	25,916,793.30	2,227,641,715.58	2,173,414,084.69
<u>ACCUMULATED DEPRECIATION</u>									
AS AT 01 -01-2013	-	47,649,812.84	14,352,195.07	88,460,363.39	49,750,760.24	36,848,427.30	10,247,864.64	247,309,423.48	211,950,142.87
ADDITIONS	-	8,593,829.15	4,742,272.20	8,745,771.29	8,383,913.28	1,914,496.24	1,286,119.07	33,666,401.23	40,711,986.77
DSPOSALS	-	-	-	1,292,810.99	432,235.00	1,996,330.76	134,968.48	3,856,345.23	5,352,706.16
AS AT 31 -12-2013	-	56,243,641.99	19,094,467.27	95,913,323.69	57,702,438.52	36,766,592.78	11,399,015.23	277,119,479.48	247,309,423.48
<u>CARRYING VALUE</u>									
WORKING PROGRESS								3,278,323.86	7,449,283.89
AS AT 31 DECEMBER 2013	1,522,283,873.98	164,409,703.70	87,956,258.40	119,822,390.32	22,141,223.85	19,391,007.78	14,517,778.07	1,953,800,559.96	
AS AT 31 DECEMBER 2012	1,522,283,873.98	170,396,127.89	80,493,248.95	103,200,907.37	26,460,037.61	15,187,657.08	15,532,092.22	1,933,553,945.10	1,933,553,945.10

AMORTIZATION - ESTATE IMPROVEMENT	4,742,272.20
ASSETS DEPRECIATION - HEAD OFFICE	21,979,244.66
ASSETS DEPRECIATION - ESTATES	2,464,822.92
ASSETS DEPRECIATION - CESS PROJECTS	3,955,828.05
ASSETS DEPRECIATION - DONOR PROJECTS	524,254.64
	<u>33,666,422.47</u>

Notes to the Financial Statements (Contd)

As at 31 December

	2014 ACTUAL Rs.	2013 ACTUAL Rs.
Note 11		
<u>BIOLOGICAL ASSETS</u>		
LIVE STOCK	8,821,092.50	7,002,262.50
	8,821,092.50	7,002,262.50
	2014 BUDGET Rs.	2014 ACTUAL Rs.
		2013 ACTUAL Rs.
Note 12		
<u>OTHER NON FINICIAL ASSETS</u>		
LIBRARY BOOKS & PERIODICALS	23,874,000.00	2,750,561.18
	23,874,000.00	2,749,377.18
		2014 ACTUAL Rs.
		2013 ACTUAL Rs.
Note 13		
<u>OTHER NON CURRENT ASSETS</u>		
DISTRESS LOAN	12,258,465.00	13,380,182.20
TRANSPORT LOAN	917,298.16	533,097.80
	13,175,763.16	13,913,280.00
		2014 ACTUAL Rs.
		2013 ACTUAL Rs.
Note 14		
<u>CASH & CASH EQUIVALANTS</u>		
BANK OF CEYLON - DANKOTUWA - A/C NO 3002507	2,313,437.38	1,203,100.20
BANK OF CEYLON - DANKOTUWA - A/C NO 3002942	10,798,283.19	9,577,929.15
BANK OF CEYLON - DANKOTUWA - A/C NO 3002556	9,237,637.89	64,602.41
BANK OF CEYLON - DANKOTUWA - A/C NO 3003088	33,675,168.47	3,190,597.64
BANK OF CEYLON - DANKOTUWA - A/C NO 3002557	86,035.48	86,035.48
BANK OF CEYLON - DANKOTUWA - A/C NO 3001528	1,212,689.02	1,217,987.51
	57,323,251.43	15,340,252.39
<u>SAVINGS DEPOSITS</u>		
CASH IN TRANSIT	392,290.42	16,609.38
NSB - NEGOMBO	1,000.00	1,000.00
BOC - NEGOMBO	4,000.00	
	397,290.42	17,609.38
TOTAL	57,720,541.85	15,357,861.77

	2014	2013
	ACTUAL	ACTUAL
	<u>Rs.</u>	<u>Rs.</u>
Note 15 <u>RECIEVABLES</u>		
SALES LEDGER CONTROL ACCOUNT	22,640,581.85	16810227.32
LESS - BAD & DOUBTFUL DEBTS PROVISION FOR THE YEAR	<u>(2,022,966.91)</u>	<u>(1,072,147.73)</u>
	<u>20,617,614.94</u>	<u>15,738,079.59</u>
POST MASTER GENERAL	31,620.00	31,620.00
INTEREST RECIEVABLE ON FD	572,849.60	-
SALARY CONTROL	<u>222,157.61</u>	<u>-</u>
	<u>21,444,242.15</u>	<u>15,769,699.59</u>
	2014	2013
	ACTUAL	ACTUAL
	<u>Rs.</u>	<u>Rs.</u>
Note 16 <u>INVENTORIES</u>		
COCONUT	32,690,385.40	28,113,679.40
COPRA	911,230.25	900,764.11
SEEDLING STOCKS	14,761,450.00	7,729,675.00
GENERAL STORES/ESTATE	4,172,703.10	3,637,683.78
FERTILIZER	6,976,585.95	4,144,310.97
CHEMICAL & GLASSWARE	18,450,026.98	18,342,073.25
STOCK OF PUBLICATIONS	<u>2,228,235.00</u>	<u>2,581,315.00</u>
	<u>80,190,616.68</u>	<u>65,449,501.51</u>
	2014	2013
	ACTUAL	ACTUAL
	<u>Rs.</u>	<u>Rs.</u>
Note 17 <u>PREPAYMENTS</u>		
INSURENCES	300,145.50	498,434.57
	<u>300,145.50</u>	<u>498,434.57</u>

	2014 ACTUAL Rs.	2013 ACTUAL Rs.
Note 18		
<u>OTHER CURRENT ASSETS</u>		
ADVANCE TO LOCAL SUPPLIERS	8,010,671.02	673,666.77
ADVANCE TO STAFF	35,000.00	35,000.00
MOBILIZATION ADVANCE & ADVANCE TO FOREIGN SUPPLIERS	2,882,550.36	1,889,817.00
FIXED DEPOSITS - BOC	15,000,000.00	11,004,000.00
SECURITY DEPOSIT RECIEVABLE	245,650.00	245,650.00
DISTRESS LOAN	5,260,550.00	5,129,749.00
TRANSPORT LOAN	481,750.00	909,750.00
WAGES ADVANCE	30.00	174,517.72
FESTIVAL ADVANCE	443,300.00	471,450.00
SPECIAL ADVANCE	3,000.00	450.00
SPECIAL SALARY ADVANCE	220,700.00	286,660.00
FESTIVAL ADVANCES TO LABOURERS	505,000.66	556,150.66
SPECIAL SALARY ADVANCES TO LABOURERS	116,614.53	160,038.84
	<u>33,204,816.57</u>	<u>21,536,899.99</u>

	2014 ACTUAL Rs.	2013 ACTUAL Rs.
Note 19		
<u>PAYABLES</u>		
ACCRUED EXPENSES	16,716,219.09	5,018,789.87
EXPENCE CREDITORS	18,570,168.89	6,897,514.15
UCLAIMED WAGES	14,579.23	13,875.34
UNPAID SALARIES	62,624.37	19,150.00
PROVISION FOR AUDIT FEES	1,200,000.00	800,000.00
PROVIDENT FUND (LABOURER)	17,654.36	22,772.65
SECURITY DEPOSITS	121,753.47	119,753.47
RETENTION	1,682,110.61	1,402,119.84
SECURITY DEPOSIT STAFF	49,000.00	49,000.00
TENDER DEPOSIT PAYABLE	488,200.00	266,100.00
AID FROM CESS FUND FOR SPECIAL PROJECTS	-	-
	<u>38,922,310.02</u>	<u>14,609,075.32</u>

	2014 ACTUAL Rs.	2013 ACTUAL Rs.
Note 20		
<u>EMPLOYEE BENEFITS</u>		
PROVISION FOR GRATUITY	105,512,659.96	99,824,533.42
	<u>105,512,659.96</u>	<u>99,824,533.42</u>

	2014	2013
	ACTUAL	ACTUAL
	<u>Rs.</u>	<u>Rs.</u>
Note 21		
<u>NON CURRENT LIABILITIES</u>		
CONTRIBUTED CAPITAL - PROJECTS	11,264,711.45	10,365,436.70
FOREIGN AID	6,616,826.97	6,616,826.97
LOCAL AID	-	-
	<u>17,881,538.42</u>	<u>16,982,263.67</u>



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கணக்காய்வாளர் தலைமை அறிப்பி திணைக்களம்
AUDITOR GENERAL'S DEPARTMENT



මගේ අංකය } LP/K/CRB/1/14/05
 எனது இல. }
 My No. }

ඔබේ අංකය }
 உமது இல. }
 Your No. }

දිනය } 2015 දෙසැම්බර් 15 දින
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පොල් පර්යේෂණ මණ්ඩලයේ 2014 දෙසැම්බර් 31 දිනෙන් අවසන් වර්ෂය සඳහා වූ මූල්‍ය ප්‍රකාශන පිළිබඳව 1971 අංක 38 දරන මුදල් පනතේ 14(2) (ඔ) වගන්තිය ප්‍රකාර විගණකාධිපති වාර්තාව

මාගේ සමාංක හා 2015 සැප්තැම්බර් 18 දිනැති ලිපියට යොමුවේ.

02. ඉහත සඳහන් ලිපිය සමඟ එවන ලද මාගේ වාර්තාවේ ඉංග්‍රීසි අනුවාදය මේ සමඟ එවා ඇත.

Handwritten Signature
 එච්.එම්.ගාමිණි විජේසිංහ
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- පිටපත්: 1. ලේකම් - වැවිලි කර්මාන්ත අමාත්‍යාංශය
 2. ලේකම් - මුදල් අමාත්‍යාංශය



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கணக்காய்வாளர் தலைமை அறிப்பறி திணைக்களம்
AUDITOR GENERAL'S DEPARTMENT



මගේ අංකය } LP/K/CRB/1/14/05
 எனது இல. }
 My No. }

ඔබේ අංකය }
 உமது இல. }
 Your No. }

දිනය }
 திகதி }
 Date }

18 September 2015

The Chairman,
 Coconut Research Board

Report of the Auditor General on the Financial Statements of the Coconut Research Board for the year ended 31 December 2014 in terms of Section 14(2) (c) of the Finance Act, No. 38 of 1971

The audit of financial statements of the Coconut Research Board for the year ended 31 December 2014 comprising the statement of financial position as at 31 December 2014 and the statement of financial performance, the statement of changes in equity and cash flow statement and a summary of significant accounting policies and other explanatory information 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 Section 13(1) of the Finance Act, No. 38 of 1971 and Section 43 of the Coconut Development Act, No.46 of 1971 . My comments and observations which I consider should be published with the Annual Report of the Board in terms of Section 14(2) (c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7) (a) of the Finance Act will be issued to the Chairman of the Board in due course.

1.2 Management's Responsibility for the Financial Statements

The management is responsible for the preparation and fair presentation of these financial statements in accordance with Sri Lanka Public Sector Accounting Standards and for such internal control as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements, whether due to fraud or error.



1.3 Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards consistent with International Standards of Supreme Audit Institutions (ISSAI 1000-1810). Those Standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Board's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Board's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements. Sub-sections (3) and (4) of Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

2. Financial Statements

2.1 Opinion

In my opinion, the financial statements give a true and fair view of the financial position of the Coconut Research Board as at 31 December 2014 and its financial performance and cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards.



2.2 Comments on Financial Statements

2.2.1 Sri Lanka Public Sector Accounting Standards

According to Standard 07, a policy had not been introduced in respect of depreciation of library books and periodicals costing Rs.2,750,561 as at the end of the year under review.

2.3 Accounts Receivable

An advance amounting to Rs.1,729,881 paid in the years 2009 and 2010 to a foreign institution to purchase electronic magazines, had not been settled even by the end of the year under review.

3. Financial and Operating Review

3.1 Financial Review

According to the financial statements presented, the financial result of the Board for the year ended 31 December 2014 had been a surplus of Rs.70,491,247 as compared with the corresponding surplus of Rs.40,704,143 for the preceding year, thus indicating an improvement of Rs.29,789,104 representing 73 per cent in the financial result of the year under review as compared with the preceding year.

3.2 Analytical Financial Review

The following observations are made.

- (a) Sixty two per cent of the entire income of the Board had generated from operating activities and 38 per cent had received as Government grants.
- (b) The income generated from operating activities amounted to Rs.298,339,973 and it covered only 73 per cent out of the entire operating expenditure amounting to Rs.407,510,726.



4. Operating Review

4.1 Management Inefficiencies

The following observations are made.

(a) Coconut Crop

The Board had maintained 04 Genetic Resources Centres and 06 Research Centres in the year under review. The following matters were revealed at the analytical review of the coconut crop of those estates.

Genetic Resources / Research Centre	Estimated Crop (Nuts)		Actual Crop (Nuts)		Variance between the Estimated Crop and the Actual Crop-2014		Variance of the Actual Crop as compared with the preceding year	
	2014	2013	2014	2013	Nuts	Percentage	Nuts	Percentage
Bandirippuwa	710,000	700,000	792,279	748,461	82,279	10	43,818	6
Pallama	465,000	544,000	630,840	346,817	165,840	26	284,023	82
Pottukulama	740,000	735,000	747,838	567,278	7,838	1	180,560	32
Ambakele	1,290,000	1,300,000	1,424,155	739,425	134,155	9	684,730	93
Rathmalagara	665,000	650,000	676,144	502,270	11,144	2	173,874	35
Walpita	92,000	80,000	107,963	122,620	15,963	15	-14,657	-12
Makandura	490,000	400,000	428,920	438,208	-61,080	-14	-9,288	-2
Maduruoya	610,000	577,060	776,226	656,600	166,226	21	119,626	18
Dunkannawa	40,500	32,328	51,248	53,007	10,748	21	-1,759	-3
Middeniya	50,000	--	83,050	53,457	33,050	40	29,593	55
Total	5,152,500	5,018,388	5,718,663	4,228,143	566,163		1,490,520	



- (i) The coconut yield of the Walpita Centre had decreased by 12 per cent in the year under review as compared with the preceding year and senility of the coconut plantation and removal of a large number of trees of the old coconut plantation which hinder the under-planting, had attributed to this decrease. At present, the age of this plantation is 66 years and the general lifespan of a coconut tree is 60 years. Practicing of coconut seedlings as an under-planting had been delayed unusually and it was observed in audit that the age of the under-planting is 1 to 3 years at present.
- (ii) The actual yield of the Makandura Centre in the year under review had decreased by 14 per cent as compared with the estimated yield and thinning of shoot had attributed to the decline in yield of about 500 trees. However, as a remedy to this problem, it was observed in audit that the plantation of “Tall x Dwarf Hybrid Coconut” had been commenced before 3 years instead of these trees.
- (b) Crop Per Acre and Average Annual Crop Per Tree

The information on the coconut crop per acre of 04 Genetic Centres and 06 Research Centres in the year under review is given below.

Genetic Resources / Research Centre	Extent of Lands with bearing Palms (Acres)	Number of bearing Palms	Fallen coconuts (Nuts)	Total Annual Crop (Nuts)	Annual Average Crop per Palm (Nuts)	Crop per Acre (Nuts)	Percentage of Fallen Coconuts
Bandirippuwa	287	10,706	96,669	792,279	74	2,761	12
Pallama	499	14,246	54,907	630,840	44	1,264	9
Pottukulama	210	9,409	175,560	747,838	79	3,561	23
Ambakele	329	16,917	287,802	1,424,155	84	4,329	20
Rathmalagara	226	10,598	108,679	676,144	64	2,992	16
Walpita	42	1,684	38,507	107,963	64	2,571	36
Makandura	126	4,200	111,082	428,920	102	3,404	26



Maduruoya	195	7,546	241,976	776,226	103	3,981	31
Dunkannawa	23	862	10,310	51,248	59	2,228	20
Middeniya	72	1,281	1,240	83,050	65	1,153	1
	-----	-----	-----	-----			
Total	2,008	77,449	1,126,762	5,718,663			
	=====	=====	=====	=====			

- (i) Even though the average coconut crop per acre should be between 4,500 to 5,000 nuts approximately, the coconut crop of all the estates of the Research Board had been below 4,500 nuts which is the minimum level of the coconut crop and delay in commencing the under-planting of coconut seedlings had attributed to this decrease.
- (ii) The percentage of fallen coconuts of 6 Genetic Resources /Research Centres maintained by the Board ranged from 20 per cent to 36 per cent. As such, it was observed that action had not been taken to pluck the crop on time.
- (c) There had been no similarity between information in respect of total coconut yield and the number of bearing palms for the year under review made available by the network information system for the investigation of the progress of the estates and information made available manually. According to the manual system, the coconut yield of the 10 estates and a model farm belonging to the Board amounted to 5,718,663 for the year under review and according to the network system it had been 5,742,359, thus observing a difference of 35,605 coconut nuts. Moreover, according to the manual system, the number of bearing palms amounted to 77,449 and according to the network information system, it had been 77,280, thus observing a difference of 3,531 coconut palms. A problem in fulfilling the objective of reviewing the progress of the coconut estates sector daily, weekly, monthly and annually through a proper information system could have arisen.



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 Auditor General's Department

- (d) Action had not been taken to recover a sum of Rs.15,825,789 recoverable from 07 foreign scholarship holders who had not completed the compulsory service period after studying, from respective officers or from the guarantors.

- (e) The coconut maita damage had mostly affected the decrease in size of coconut nuts, change the shape and fall of immature nuts in Gene Resources/Research Centres and the Research Board had presented inter-recommendations as remedies therefor. Further, the Research Board had introduced the predator maita as a sustainable biological method to control this maita. Accordingly, the Research Board had commenced and maintained three predator maita centres. The number of coconut nuts small in size affected by coconut maita had taken a high value of 236,482 in the year under review relating to 10 model coconut gardens maintained by the Board under the circumstance in which inter-recommendations and the biological method named predator maita are implemented to control the maita damage.

- (f) A land had been identified from Punarin in Kilinochchi District on the requirement of an area where a silviculture exists, for the production of hybrid seednuts and the objective of this was the implementation of a garden for seednuts with a view to obtaining high quality seednuts with different coconut varieties suitable for the area for the development of coconut cultivation in Northern Province. According to the Letter dated 20 August 2012 addressed to the District Secretary of Kilinochchi by the Director General of Forest Conservation with a copy to the Director of the Coconut Research Board referred to this matter, it had been notified that this land could not be given for the relevant purpose as this land is located at Maduwilnadu Reserve. Under this circumstance, the Board had incurred an expenditure amounting to Rs.2,118,510 to purchase tractors and furniture for the above project in the year under review. Moreover, sums of Rs.4,110,400 and Rs.1,460,140 had been paid as advances to the Sri Lanka Army and external institutions respectively to purchase tractors to clear the above land.



- (g) Objectives intended to fulfill by using computerized accounting software through the accounting software which is used by the Board could not be fulfilled and it was observed that use of passwords and maintenance of back up are not carried out properly. Entering data by using the software is not carried out daily and it had not been apparent that reports obtained through that software had been certified by an officer who prepared or checked them.

4.2 Personnel Administration

The approved cadre and the actual cadre of the Board had been 391 and 296 respectively. The posts of senior, tertiary and secondary levels relating to operating activities had been 09, 19 and 45 respectively and 22 posts of primary level had been vacant.

5. Accountability and Good Governance

5.1 Budgetary Control

Variance between the budgeted and the actual values of eight items shown in the financial statements as at the end of the year under review amounted to Rs.255,818,371, thus indicating that the budget had not been made use of as an effective instrument of financial control.

6. Systems and Controls

Deficiencies in systems and controls observed during the course of audit were brought to the notice of the Chairman of the Board from time to time. Special attention is needed in respect of the following areas of control.

- (a) Accounting
- (b) Human Resources Management
- (c) Conservation of Crops

W. P. C. Wickramaratne
Acting Auditor General