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DEPARTMENT OF AGRICULTURE
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SRI LANKA

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Vision

Achieve excellence in agriculture for national prosperity.

Mission

Development and dissemination of improved agricultural technology and providing related services to all stakeholders with emphasis on farmers to achieve an equitable and sustainable agricultural development to ensure food and nutritional security for the nation.

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FOREWORD

Year 2017 was another fruitful year for the Department of Agriculture in terms of the activities taken to increase the production and productivity of food crops. During the year 2017, the technical activities of the DOA were concertedly focused on the production and productivity enhancement of crops namely rice, other field crops, potato, vegetables and fruit crops, which are immensely important for the economy of the country. With the objective of achieving the self-sufficiency and reducing the import of these crops, as aimed by the National Food Production program launched by the Ministry of Agriculture, DOA is actively involved in the campaign by planning out specific activities to be carried out with regard to each of the crops identified, implementing the activities with the collective support of all stakeholders, providing necessary inputs in terms of seed, planting material and technical know-how to the targeted groups.

Through the research program, DOA has been able to produce several new varieties of crops with higher yields and better quality characters as well as several new technologies of cultivation. Seed & planting material production and certification programs were continued while acting as the regulatory body of implementing Seed Act, Plant Protection Act, Pesticide Control Act and the Soil Conservation Act in order to protect the sustainability of agriculture in the country. Agricultural extension programs were geared towards dissemination of improved technologies, promoting mechanization and popularizing methods to increase efficiency of usage of fertilizer and water along with providing agricultural education under new curriculum as per NVQ standards through Sri Lanka Schools of Agriculture.

The measures taken to increase efficiency of usage of inputs and energy for agricultural activities by the DOA were rewarded by the Presidential Environmental award for the large scale green farm of Regional Agricultural Research & Development Centre, Kilinochchi and farm of the Field Crop Research & Development Institute, Mahalluppallama winning the 2nd place of the non-plantation sector at the national award ceremony organized by the Council for Agriculture Research Policy.

I appreciate the efforts of all officers of the DOA in achieving the success contained in this publication. I also thank the editors and the Progress Monitoring & Evaluation Unit for their unstinted effort to complete this publication within the stipulated period.



Dr. W.M.W. Weerakoon

Director General of Agriculture

HIGHLIGHTS – 2017

New crop varieties released

Cowpea

ANKCP 2



- Can be harvested in 64 - 68 days after planting
- Average yield is 1500 - 1600 kg/ha
- Large size seeds with attractive colour (Light brown-white)
- Seeds separated from fresh pods can be cooked or dry seeds can be boiled for consumption
- Harvest can be obtained 3- 4 times

Bean

Kekulu Bonchi (PB 161)



- Potential yield is 23 - 25 t/ha
- Harvest can be obtained within 60 - 63 days after planting
- Produce green colour, smooth round pods of medium length with less prominent seeds
- Pods are produced uniformly throughout the vine and harvest can be obtained 8 - 9 times
- Tender appearance of the pod remains even if harvesting is delayed

Chilli

MICH HY 2



- A hybrid variety with a potential yield of 35 t/ha (30 - 40% higher yield than the other DOA recommended open pollinated varieties)
- Length of a pod is around 13 cm
- Can be used as fresh or dry chilli
- Moderately resistant to the leaf curl disease and therefore pesticide usage can be reduced

Mango

Horana Hiru



- Recommended for the Low Country Wet Zone
- Having a vigorous vegetative growth with regular annual flowering
- Moderately resistant to Anthracnose disease
- High keeping quality
- Color of mature fruits - Yellow waxy
- Bagging is essential after 20 days of fruit formation to get yellow peel color and avoid pest and disease incidents

Passion fruit

Horana Gold



- High yielding variety propagated by seeds
- Average fruit weight - 155 g
- Pulp color - Yellow orange
- Peel color at ripening - Yellow orange
- Fruit shape - Elongated/ round
- Recommended for Low and Mid Country Wet, Intermediate and Dry Zones

Bandarawela Purple



- Fruit weight is around 100 - 120 g with a reddish purple peel
- Tender leaves and tendrils are purple
- Juice is yellow in colour
- Harvest can be obtained in 10 months after planting (1st year - 16 kg/ vine, 2nd year - 24 kg/ vine)
- Moderately resistant to viruses and root rot
- Recommended for Up Country Intermediate and Wet Zones

Mandarin

Juicy



- Dual purpose variety suitable especially for juice production
- Year round production with two major seasons
- High yielding variety (60 kg/ plant/ year)
- Large fruits (100 - 130 kg)
- Orange color flesh
- Recommended for Low Country Wet Zone

Nelli

Gannoruwa Nelli



- Attractive large size (40 - 70 g) fruit with yellowish green colour at maturity
- Flowering and fruiting in a short period: At about 2 ½ - 3 years after planting.
- Heavy bearing variety with around 150 kg of fruit yield per plant in about 3 years after 1st fruiting.
- Can be successfully cultivated in containers and useful in urban agriculture

Jamun/ Madan

Gannoruwa Madan



- Larger fruit size (13 g) compared to the local cultivars (1.5 g)
- Fleshy fruit with attractive purple color
- Delicious (high Brix value - 18) compared to local cultivars (Brix - 9)
- Can be cultivated successfully in containers and recommended for Wet Zone

Gannoruwa Ela Dan



- Very rare Madan species in attractive fruit color of light green
- Fleshy and juicy fruit
- Tasty (Sweet) fruit with a Brix value of about 15
- Can be cultivated successfully in containers

Pomegranate

Kalpitiya Hybrid



- First hybrid Pomegranate variety produced by the DOA
- Fruit peel is thin and orange - pink in colour
- Soft seeded fruit with red colour sweet flesh (Brix value 15 - 16)
- Medium round size fruits of 230 - 260 g in weight (4 - 5 fruits/ kg)
- Appearance of the fruit is competitive with the imported fruits
- Antioxidant activity is higher than the imported varieties
- Propagated by grafting of plants

Outcome of Research

- Selected rice lines were tested for submergence tolerance in flood prone fields in Kalutara District. One line with 80% recovery after being submerged twice during vegetative stage and flowering stage was identified as promising.
- Machine transplanting was promoted for paddy and farmers were interested in adopting the technique for better production.
- Expansion of paddy lands by combining small paddy plots were practiced in Polonnaruwa under CORIGAP project (small scale foreign funded project). Ten or more small plots in an acre were rearranged into 3 - 4 large plots by removing unnecessary bunds facilitating effective cultivation through easy handling of farm machinery.
- As a remedy for decrease in food production due to adverse weather conditions a new technique of cultivating Sweet potato in empty polysac bags was promoted. Sweet potato and Manioc planting materials were distributed among farmers of 43 villages under this program.



Cultivating Sweet potato in polysac bags

- Under the project on development of Bio-intensive Integrated Pest and disease Management (BIPM) programs for major pests and diseases of horticultural crops in Sri Lanka, an effective and long lasting pheromone: insecticide combination was identified as 1 ml (Methyl eugenol) : 0.15 ml Abemectin. Cotton wool was identified as the best absorbent material which maintains its efficacy up to 2 months inside the trap.
- Two new agronomic packages were developed for Chilli with drip irrigation and for Mung bean with sprinkler irrigation which can be used to increase the productivity of green Chilli and Mung bean yields up to 45 t/ ha and 2.5 - 3 t/ ha respectively under micro irrigation systems while reducing the irrigation water consumption by around 30 - 50 % compared to surface irrigation.



Cultivations of Chilli and Mung bean with new irrigation packages

- Under the project on development of a suitable seed film coating technique to increase the storage life of vegetable seeds, a suitable seed film coating was applied for Chilli, Capsicum and Okra seeds.



Film coated Cowpea & Okra seeds



Seed film coating machine

- As locations with potential for off-season cultivation, 12 new locations have been identified for vegetables, 05 locations for fruit crops and 19 locations for other field crops.
- Drought prone area map of Sri Lanka was developed using MODIS satellite data of past 16 years (2000 - 2016) and finalizing the map is in progress.
- Activities under the Soil Conservation Act were implemented through the collaboration of Provincial Departments of Agriculture. Appropriate soil conservation measures/ structures were established in micro water-shed based farmer fields. The program covered 130 acres of farmer fields in seven districts.



Soil conservation demonstration sites in Mulgama & Badulla district

Development Work

- Under the Agriculture School development program, construction of new buildings with lecture halls, libraries and staff rooms for Agriculture schools at Karapincha, Kundasale and the 2nd phase of the two story building at Angunakolapelessa were completed. In addition, purchasing of laboratory equipment for Pelwehera, renovation of buildings including dining hall at Vavuniya and installation of high capacity water purifier at Paranthan were completed.



New building and IT Centre of Agriculture School, Kundasale

- Infrastructure at Farm Machinery Research Centre, Mahalluppallama has been improved with construction of irrigation canals, fences, roads, improvement of conference room, purchasing of laboratory equipment and installation of solar panels.



Construction of irrigation canals and fences around testing and research fields



Installation of solar panels

Improvement of Conference room



Farm machinery testing laboratory

- District level soil testing laboratories (20 No.s) were established in 20 districts. Analysis of 11,430 No. of soil samples was completed and fertilizer recommendations will be given at GS division level for lowland paddy cultivation.



Soil testing laboratories

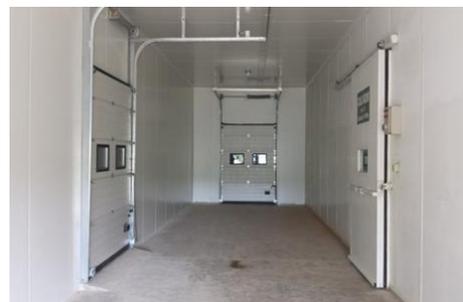
- Under the project on Production and productivity improvement of local potato, three large scale poly tunnels (800 m²) and twenty 400 m² poly tunnels were constructed respectively for G₀ and G₁ seed potato production. Seed potato storage was also facilitated through construction of a new cold room and expanding the existing cold room at government seed farm, Sita Eliya.



Poly tunnels at Sita Eliya farm for G₀ seed potato production



Poly tunnels at Sita Eliya farm for G₁ seed potato production



Renovated and newly constructed cold rooms at Sita Eliya farm

Other Activities

- Eighty No. of farm machinery and equipment worth of Rs. 8.2 million were purchased for distribution among farmers under the National Food Production program.



Bund forming machine distributed under National Food Production program

- Under the project on Commercial farming and agribusiness development, financial support was given for entrepreneurs to buy required machinery, micro irrigation systems, shade nets, insect proof nets and to construct protected houses.



Rice milling machine



Protected house for bell pepper with drip irrigation

- Under the project on Production and productivity improvement of paddy, 101,640 No. of parachute trays were provided for field demonstrations and 1,585 No. of leaf color charts were distributed among small farmer groups with the objective of improving efficiency of fertilizer usage.



Distribution of parachute trays and leaf color charts among farmers



Conducting demonstrations for popularizing mechanization of transplanting

- Local and imported hybrid seeds were provided for 5,609 ha under 50% farmer contribution in order to popularize hybrid varieties under the project on Production and productivity improvement of Maize. Contract seed production program was conducted in 30 ha to promote local hybrid seed production.

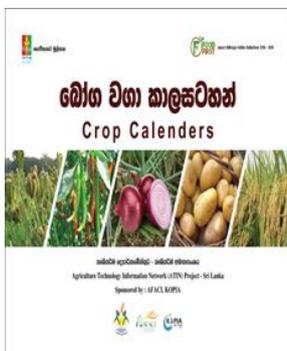


Distribution of hybrid Maize seeds for field demonstrations



Contract seed production to promote local hybrid seed production

- To promote Soybean cultivation, seeds were supplied free of charge for 6,477 ha, and Rizobium inoculum were given for 1,761 ha and an allowance for land preparation was given for 3,174 ha. In addition, 4 seeders, 8 intercultivators and 2 reapers were provided.
- Printed 94,197 copies of 37 books, 44,790 copies of 10 leaflets, 19,000 copies of Crop Calendar book and 1,000 copies of one interactive multimedia compact disc (IMMCD) were replicated during 2017.



Crop Calendar



Publications on bee keeping

- With the objective of popularizing bee keeping for commercial bee honey production as well as for crop pollination, 106 bee keeping villages were established throughout 25 districts and a bee box, smoker and a colony were distributed among 2,120 beneficiaries under the Bee development program.
- Construction of Padiyatalawa, Wakarai and Kantale ‘Hela bojun’ sales outlets were completed and 03 new ‘Hela bojun’ sales outlets were opened at Nittambuwa, Jaffna and Matara. During the year, 68 farm women were employed as entrepreneurs in connection with the ‘Hela bojun’ sales outlets and 56 entrepreneurship trainings were conducted.



‘Hela bojun’ Sales Centre, Matara



Opening of ‘Hela bojun’ Sales Centre, Nittambuwa



Thinnavelly ‘Hela bojun’ Sales Centre

- Under the project on establishment of a mechanism to provide safe agricultural produce with high quality for local and foreign markets through Good Agricultural Practices (GAP), 146 farms have been certified and 22 model farms have been established. Database on GAP certified farms is being updated with 1,900 entries and 2,308 No. of stores of fruits and vegetables for the export market have been examined for GAP standards.



GAP certified farms in Nuwara Eliya and Matara

- During the year 2017, two Agriculture Diploma awarding ceremonies were held for 617 No. of NVQ level 6 students and 340 No. of NVQ level 5 students of Schools of Agriculture.



Agriculture Diploma awarding ceremonies

Awards

- Regional Agricultural Research & Development Centre of Kilinochchi received the Presidential Environmental award for the large scale green farm at the Environmental Award ceremony organized by the Ministry of Environment held at BMICH.



- Farm of the Field Crop Research & Development Institute, MahaIuppallama received the 2nd place of the non-plantation sector at the national award ceremony organized by the Co uncil for Agriculture Research Policy (CARP).



ABBREVIATIONS & ACRONYMS

Ac	-	acre	BAP	-	6-Benzylaminopurine
AC	-	Accession	B.Ed.	-	Bachelor of Education
ACA	-	<i>Allium cepa</i> accessions	BL	-	Rice Blast
ADA (E)	-	Assistant Director of Agriculture (Agricultural Economics)	BLB	-	Bacterial Leaf Blight
ADA (D)	-	Assistant Director of Agriculture (Agricultural Development)	BLIS	-	Bachelor of Library & Information Science
ADA (R)	-	Assistant Director of Agriculture (Agricultural Research)	B.M.S.	-	Bachelor of Management Science
ADA	-	Assistant Director of Agriculture	bp	-	Base pair
Addl. D.	-	Additional Director	BPH	-	Brown plant hopper
AER	-	Agro Ecological Region	BRS	-	Basel, Rotterdam & Stockholm Conventions
AFACI	-	Asian Food & Agriculture Cooperation Initiative	BSV	-	Banana Streak Virus
Ag.	-	Agricultural	B.Tec.	-	Bachelor of Technology
Agric.	-	Agricultural	Bu	-	bushel
AI	-	Agriculture Instructor	CABI	-	Commonwealth Agricultural Bureau International
ALS	-	Acetolactate Synthase	CARP	-	Council for Agricultural Research Policy
AMIE	-	Associate Member of the Institution of Engineers	CCAFS	-	Climate Change, Agriculture & Food Security
ANSOFT	-	Asian Network for Sustainable Organic Farming Technology	CEC	-	Cation Exchange Capacity
APeSC	-	Agricultural Pesticides Sub- committee	CEOA	-	Centre of Excellence for Organic Agriculture
ASTA	-	Agrochemical Sales & Technical Assistant	CIP	-	International Potato Centre
ATIN	-	Agriculture Technology Information Network in Asia	CLS	-	<i>Circospora</i> Leaf Spot
AVRDC	-	Asian Vegetable Research and Development Centre	CMS	-	Cytoplasm Male Sterile
AuOO	-	Authorized Officers	CNLD	-	Chilli Narrow Leaf Disorder Cooperation Initiative
AWRN	-	Api Wawamu Rata Nagamu	CODEX	-	Codex Alimentarius Commission
B.A.	-	Bachelor of Arts	COPS	-	Conferences of Parties
B.B.A.	-	Bachelor of Business Administration	CRC	-	Chemical Review Committee
B.Sc.	-	Bachelor of Science	CRI	-	Coconut Research Institute
BA	-	Benzyladenine	CRVT	-	Coordinated Rice Varietal Testing
			CS ₂	-	Carbon Disulphide
			DAS	-	Days After Sowing

DATC	- District Agricultural Training Centre	FRDI	- Fruit Research & Development Institute
DD (D)	- Deputy Director of Agriculture (Agricultural Development)	FTIR	- Fourier-transform infrared spectroscopy
DD (R)	- Deputy Director of Agriculture (Agricultural Research)	g	- gram
DD	- Deputy Director	GA3	- Gibberellic Acid
DDA	- Deputy Director of Agriculture	GAP	- Good Agricultural Practice
DEC	- Dedicated Economic Center	GC	- Gas Chromatography
DF	- Dry Flowables	GLORDC	- Grain Legume & Oil Crop Research & Development Centre
DGA	- Director General of Agriculture	GLP	- Good Laboratory Practices
Dip.	- Diploma	GM	- Gall Midge
DL	- Low Country Dry Zone	GNBV	- Ground nut bud necrosis virus
DMSO	- Dimethyl sulfoxide	GPS	- Global Positioning System
DOA	- Department of Agriculture	ha	- hectare
DPD	- Deputy Provincial Director	HERP	- High grade Eppawala Rock Phosphate
DRF	- Dependable Rainfall	HNDAPT	- Higher National Diploma in Agriculture Production & Technology
dS	- deci Siemens	HORDI	- Horticultural Crop Research & Development Institute
DUS	- Distinctness, Uniformity and Stability	Hq.	- Head quarters
EC	- Emulsifiable Concentrate	HRAC	- Herbicides Resistance Action Committee
EMS	- Ethyl Methane Sulfonate	HTDI	- Horticultural Training & Development Institute
ESCAP	- Economic and Social Commission for the Asia Pacific	IAA	- Indole-3-acetic acid
ETC	- Extension & Training Centre	IBA	- Indole-3-butyric acid
ETO	- Ethylene oxide	IC	- In Charge
ETU	- Ethylene thiourea	ICP-MS	- Inductively coupled plasma mass spectrometry
EU	- European Union	ICRISAT	- International Crop Research Institute for Semi Arid Tropics
FAO	- Food and Agricultural Organization	IIRR	- Indian Institute of Rice Research
FBS	- Farm Broadcasting Service/ Farmer Business School	IITA	- International Institute for Tropical Agriculture
FCRDI	- Field Crop Research & Development Institute	IL	- Low Country Intermediate Zone
FIM	- First Inter Monsoon	IM	- Mid Country Intermediate Zone
FMTC	- Farm Mechanization Training Center		
FRAC	- Fungicides Resistance Action Committee		

INFORM	- Information for Agricultural Research Management	KVSN	- Krushikarma Vyapthi Seva Niladhari
INGER	- International Network for Genetic Evaluation of Rice	L	- litre
IPeSC	- Industrial Pesticides Sub Committee	L.L.B.	- Bachelor of Laws
IPPC	- International Plant Protection Convention	LCIZ	- Low Country Intermediate Zone
IPM	- Integrated Pest Management	LCWZ	- Low Country Wet Zone
IPNS	- Integrated Plant Nutrient System	LED	- Light emitting diode
IPO	- Intellectual Property Office	LOQ	- Level of Quantification
IRFAON	- International Rice Fine and Aromatic grain Observation Nursery	LOD	- Limit of Detection
IRAC	- Insecticide Resistance Action Committee	LSVAT	- Large Scale Varietal Adaptability Trial
IRRI	- International Rice Research Institute	M.A.	- Master of Arts
IRSSTN	- International Rice Soil Stress Tolerance Nursery	M.Ec.	- Master of Economics
ISCAP	- Implementation of Soil Conservation Act Program	MOA	- Ministry of Agriculture
ISO	- International Standard Organization	M.Sc.	- Master of Science
ISPM	- International Standards on Phytosanitary Measures	MAI	- Moisture Availability Index
ISSR	- Inter Simple Sequence Repeat	mg	- Milli gram
ISTA	- International Seed Testing Association	ml	- Millilitre
ITI	- Industrial Technology Institute	mm	- Milli meter
IU	- Up Country Intermediate Zone	mt	- metric ton
IW/ CPE	- Irrigation Water/ Cumulative Pan Evaporation	MMDE	- Ministry of Mahaweli Development & Environment
IWMI	- International Water Management Institute	MPET	- Medium density Poly Ethylene Terephthalate
JICA	- Japan International Cooperation Agency	MR	- Moderately Resistant
KOPIA	- Korean Project on International Agriculture	MRL	- Maximum Regulatory Limit
KSP	- Krushi Seva Piyasa	MS medium	- Murashige & Skoog medium
		MS	- Mass Spectrophotometry/ Moderately Susceptible
		msl	- Mean sea level
		mt	- Metric ton
		MYMV	- Mung bean Yellow Mosaic Virus
		MYT	- Major Yield Trial
		NAA	- Naphthalene Acetic Acid
		NAICC	- National Agricultural Information & Communication Centre
		NAITA	- National Apprentice and Industrial Training Authority

NARP	- National Agricultural Research Project	PGPR	- Plant Growth Promoting Rhizobacteria
NBPGR	- National Bureau of Plant Genetic Resources	PGR	- Plant Genetic Resources/ Plant Growth Regulator
NCB	- Non Calcic Brown	Ph.D.	- Doctor of Philosophy
NCRVT	- National Coordinated Rice Varietal Trial	PHI	- Pre Harvest Intervals
NCVT	- National Coordinated Varietal Trial	PIC	- Prior Informed Consent
NEAP	- National Environmental Action Plan	PHPeSC	- Public Health Pesticides Sub-Committee
NCHST	- National Coordinated Herbicide Screening Trial	PMEU	- Progress Monitoring & Evaluation Unit
NIAS	- National Institute of Agro biological Sciences	POP	- Persistent Organic Pollutants
NPK	- Nitrogen, Potassium and Phosphorus	POPRC	- Persistent Organic Pollutants Review Committee
NPQS	- National Plant Quarantine Service	PPE	- Personal Protective Equipment
NRC	- National Research Council	ppm	- Parts per million
NRMC	- Natural Resources Management Centre	PQS	- Plant Quarantine Station
NVQ	- National Vocational Qualifications	PSC	- Phytosanitary Certificate
OD	- Oil Dispersion	PTU	- Propylene thiourea
OFC	- Other Field Crops	PTWG	- Provincial Technical Working Group
OJT	- On the job training	PYT	- Preliminary Yield Trial
PB	- Pole bean	QC	- Quality Certificate
PCCC	- Permanent Crop Clinic Committee	QMS	- Quality Management System
PCR	- Polymerase Chain Reaction	QPS	- Quarantine Pre Shipment
PCS	- Pest Control Service	R	- Resistant
PDA	- Provincial Director of Agriculture	RA	- Research Assistant
PDD	- Pesticide Dealer Database	RAPD	- Random Amplified Polymorphic DNA
PDOA	- Provincial Department of Agriculture	RC	- Rotterdam Convention/ Rooted Cuttings
PET	- Potential Evapotranspiration	REAP	- Regional Economic Advancement Project
PeTAC	- Pesticide Technical Advisory Committee	RGM	- Rice Gall Midge
		RNA	- Ribonucleic Acid
		ROP	- Registrar of Pesticides
		RRDI	- Rice Research & Development Institute
		RSC	- Rooted Stem Cuttings
		RSM	- Rice Sheath Mite

RYP	- Red Yellow Podzolic	TRI	- Tea Research Institute of Sri Lanka
S	- Susceptible	TSP	- Triple Super Phosphate
SC	- Suspension Concentrate	TVEC	- Tertiary & Vocational Education Commission
SCPPC	- Seed Certification & Plant Protection Centre	URC	- Unrooted Cuttings
SEPC	- Socio Economic & Planning Centre	US	- United States
SG	- Soluble Granules	USA	- United States of America
SIM	- Second Inter Monsoon	VAT	- Variety Adaptability Trial/ Value Added Tax
SL	- Soluble liquid	VRC	- Varietal Release Committee
SLS	- Sri Lanka Standards	WAE	- Women Agriculture Entrepreneurship
SLSI	- Sri Lanka Standard Institution	WFS	- Women Farmer Society
SLAB	- Sri Lanka Accreditation Board	WG	- Water Dispersible Granules
SLANRMP	- Sri Lanka Australia Natural Resources Management Project	WHO	- World Health Organization
SL-GAP	- Sri Lankan Good Agricultural Practices	WL	- Low Country Wet Zone
SLUSDA	- Sri Lanka – United States Development Agency	WM	- Mid Country Wet Zone
SMS	- Subject Matter Specialist	WMO	- World Meteorological Association
SOA	- School of Agriculture	WP	- Wettable Powder
SOP	- Standard Operation Procedures	WU	- Up Country Wet Zone
SPMDC	- Seed & Planting Material Development Centre	YFC	- Young Farmers Club
SriLanKoRDA	- Sri Lanka – Korea Rural Development Administration		
SSR	- Simple Sequence Repeat		
TC	- Technical Concentrate		
TOR	- Terms of Reference		
TOT	- Training of Trainers		

1.1 FIELD CROPS RESEARCH AND DEVELOPMENT INSTITUTE (FCRDI) - MAHAILLUPPALLAMA

Field Crops Research and Development Institute (FCRDI), Mahailuppallama and its satellite stations are responsible for developing varieties and other associated technologies and primary dissemination of the same to its stake holders on Other Field Crops (OFC). Crops identified as OFC in Sri Lanka are condiments (Chilli and Onions), grain legumes (Mung bean, Cowpea and Black gram), oil seeded crops (Groundnut, Soybean, Sesame and Sunflower) and coarse grains (Maize, Finger millet, Sorghum and other millets). In addition, the institute is responsible for producing adequate quantities of nuclear seeds of its mandated crops. Further, FCRDI also caters to the enhancement of the productivity of regionally important rice, fruits and vegetables. In-situ conservation of indigenous

germplasm of Dry Zone crops and utilizing them in effectively in crop improvement program and also making suitable introductions of germplasm are being done at FCRDI. To achieve all these objectives, FCRDI collaborates with national and international research and development institutes, universities and private sector organizations.

FCRDI system comprises of the main research station at Mahailuppallama, Grain Legumes and Oil Crops Research and Development Centre (GLORDC) at Angunakolapellesa, Regional Agriculture Research and Development Centers (RARDC) at Aralaganwila and Kilinochchi, and Agriculture Research Stations (ARS) at Thirunelvely and Vavuniya.

BUDGET

Table 1.1.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	17,751,866	12,757,786	72
Capital	16,867,941	12,796,026	76
Projects			
• Development of hybrid and open pollinated varieties of Chilli, Maize and Onion	43,000,000	22,960,000	53
• NARP projects			
○ Mung bean	1,370,000	1,344,794	98
○ Paddy	773,300	490,990	63
○ Onion pathology	532,000	531,467	100
• KOPIA projects			
○ Mung bean	3,610,000	2,862,991	79
○ Onion	10,884,000	4,244,650	39

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• NFPP Projects			
○ Chilli	1,000,000	914,787	91
○ Black gram	250,000	237,635	95
Total	96,039,107	59,141,126	62

PROGRESS

CROP IMPROVEMENT

Condiments

Chilli

Chilli is one of the major condiments in Sri Lanka. Present crop improvement program of Chilli is focused on the development of high yielding hybrids (> 35 t/ha of green Chilli) and open pollinated Chilli varieties (> 20 t/ha of green Chilli yield) having resistance/ tolerance to biotic stresses (fungal diseases, viral diseases and pests) and abiotic stresses (moisture stress).

- One promising Chilli hybrid with the potential green Chilli yield of 35 t/ha was released for cultivation. The variety is moderately resistant to Chilli Leaf Curl Complex.
- Three promising Chilli hybrids with the potential green Chilli yield of > 28 t/ha are being evaluated under NCVT.
- Three promising inbred lines developed under the hybrid breeding program are being evaluated under NCVT to identify as promising open pollinated varieties.
- Six promising hybrids with the green Chilli yield potential of > 28 t/ ha were selected for NCVT.
- Thirty-six hybrids were evaluated under PYT and 8 hybrids among them were identified for MYT.

- Six parent lines with better agronomic traits were developed.
- Fifteen crosses were made and 25 g of seeds from each cross were produced to find out low soil moisture tolerant Chilli hybrids.
- A total of 51 progenies of intra-specific Chilli hybrids (11 progenies of F₇ to F₈, 20 progenies of F₅ to F₆, 14 progenies of F₄ to F₅ and 6 progenies of F₃ to F₄) were advanced.
- A total of 41 progenies of inter-specific Chilli hybrids (11 progenies of F₇ to F₈ and 30 progenies of F₅ to F₆) were advanced.
- Genes responsible for Genetic Male Sterile (GMS) character were transferred in to 3 promising parent lines/ inbred lines through Back Cross breeding. Seeds extracted after the fourth back cross were subjected to self-pollination and planted in the field to identify GMS transferred progenies.
- A study was conducted to identify the effect of time of pollination on stigma receptivity with the objective of increasing F₁ seed yield of hybrids. It revealed that the maximum fruit set percentage and the maximum seed yield/ plant can be achieved by pollination on the same day of emasculation in the morning from 6.00 a.m. to 12.00 noon.
- An appropriate pollen collection method and an emasculation method were

identified. It could cut down the F₁ seed production cost by 50% mainly due to reduction in labor cost.

- A variety popularization program was conducted for the local Chilli hybrid, MICH HY 1 and 18 kg of seeds were distributed among the farmers.
- Forty-three exotic Chilli hybrids were evaluated for the yield and pest/ disease tolerance/ resistance. Six high yielding (18 -25 t/ha of green Chilli) hot pepper type hybrids with less pest and disease incidences were identified for commercial cultivation.

Chilli open pollinated variety (OPVs) development

- Fifteen parental materials were maintained and 50 g of seeds from each were produced by selfing.
- Thirteen parental lines of *Capsicum chinense* and *C. frutescens* were used in inter-specific hybridization of OPV Chilli to incorporate new genetic materials. Twenty-five grams of seeds from each were produced by selfing.
- Twenty new intra-specific crosses and five inter-specific crosses were made by hand emasculation and pollination. Seeds were extracted, dried and stored.
- The following progenies were advanced through generation advancement in 2017.

Table 1.1.2: Generation advancement of Chilli during 2017

Generation	Intra-specific hybridization	Inter-specific hybridization
F ₁	Six crosses with 30 progenies	Two crosses with 12 progenies
F ₂	Seven crosses with 35 progenies	Three crosses with 6 progenies
F ₃	Ten crosses with 50 progenies	Two crosses with 10 progenies
F ₄	Twelve crosses with 60 progenies	Two crosses with 4 progenies
F ₅	Nine crosses with 45 progenies	
F ₆	Seven crosses with 35 progenies	
F ₇	Thirteen crosses with 65 progenies	
F ₈	Ten crosses with 50 progenies	

- Recommended varieties were back crossed with Waraniya 1 (7 crosses) and Waraniya Purple (4 crosses) in order to transfer virus tolerance character. Four lines were identified for yield evaluation.
- Plant population of around 10,000 – 15,000 plants were maintained for the selection, evaluation and improvement of the variety Waraniya Green. A seed lot of 500 g was extracted.

- Improved population of Jaffna Selection, 'Hene Miris' land races and three open pollinated promising lines were tested under the NCVT. Five hundred grams of seeds from 'Hene Miris' and Jaffna Selection were produced.
- Selected 9 lines were evaluated in PYT and MYT. Three promising lines were selected for NCVT.
- Thirteen *Capsicum chinense* and *C. frutescens* accessions were characterized by morphological and molecular methods to assess the genetic diversity. Twelve morphological characters were analyzed. Analysis of Variance (ANOVA) revealed significant differences among genotypes for most of the tested traits. Pearson Correlation Coefficient showed significant positive correlations between most of the morphological traits compared. The Principal Component (PC) analysis explained more than 71% of the total variability for the first 3 components among the traits evaluated. Plant height, canopy width, days to 50% flowering, pods per plant and the yield were positively correlated. A total of 45 alleles were detected in 15 microsatellite markers across the 13 *Capsicum* accessions. Genetic diversity ranged from 0.00 to 0.75 with an average of 0.51. Ten grams of seeds were produced from each of the thirteen accessions and handed over to the PGRC for further conservation.

Onion

Onion crop improvement program is conducted aiming to develop high yielding short duration big onion varieties (40 t/ha) with longer storability (losses < 25% in 4

months storage) and resistant or tolerant to major pests and diseases. Development of high yielding (25 t/ha) seed setting cluster onion varieties with large sets to substitute big onion during off-season is a major objective in cluster onion breeding program.

- Selected big onion lines were evaluated at the FCRDI - Mahailuppallama, ARS - Thirunelvely and Weerawila in Yala 2017. MIBO 1 performed better compared to the identified promising lines selected from the yield trials conducted under favorable weather conditions in last 3 years.
- The seed setting cluster onion line MICIO 09-01(Rose) was conditionally released for cultivation. It produces large sets and is suitable for seed production. The recorded highest set yield of this variety is 29.6 t/ha.
- Crossing of Big onion and Cluster onion was done with the purpose of developing cluster onion varieties with large set size as substitute for big onion. Twenty four lines were selected and advanced to F₃ generation.
- Germplasm exploration and crossing with local and exotic lines were conducted with the objective of creating genetic variability in Onion. Two F₂ generations were advanced.

Coarse Grains

Maize

Maize breeding program is set to develop maize hybrid varieties having target yield of 8 t/ha in favorable ecosystems and to develop maize hybrids as well as parental inbred lines for moisture stressed ecosystems.

- Two hybrids, 'CLYQ220/ CL02450Q' and 'CLYQ203/ CLYQ221' evaluated in VAT showed average yields about 5 - 6 t/ha.
- Twelve selected drought resistant Maize hybrids received from CIMMYT - India were evaluated in research and farmers' fields. Five hybrids with higher yields (6 - 7 t/ha) were selected for further evaluation in VAT.
- Twenty new single cross Maize hybrids developed by CIMMYT and inbred lines were evaluated for yield. Four crosses showed comparable yields (5 - 6 t/ha) with the check hybrid.
- Ten promising Maize hybrids were evaluated in NCVT at 3 locations and one hybrid was comparable with the check hybrid.
- Sixty-four locally developed single cross Maize hybrids were evaluated. Promising hybrids and their parental lines were selected for further evaluation and for the crossing programs.
- Ten exotic Maize hybrids received from different private organizations were tested. Maize hybrids; Champ 5555, Var 153, Tech 153 and Tech 188 Tabimdang were recommended to import for the general cultivation.
- Parents of MI Maize Hybrid 01 (CML - 161, CML - 194) were subjected to gamma irradiation and the M2 generation was established in the field for further selection.
- Three promising Finger millet lines showing average yields around 3.0 - 3.75 t/ha were selected for VAT.
- Eight Finger millet accessions received from ICRISAT, India were evaluated with two recommended varieties. Those accessions showed average grain yields around 2.5 - 3 t/ha.
- Six promising Finger millet lines selected from a mixed population evaluated. Those lines showed average grain yields around 3.5 - 3.75 t/ha in both Yala and Maha seasons. One promising line was selected for NCVT.
- One bulk population of Finger millet developed through crosses in the previous season was established for selection. Fifteen pedigree lines were selected for further selection and evaluation from the fourth bulk population.
- The seeds of two recommended finger millet varieties were treated with four doses of Gamma rays. Seeds of the M1 generation of these two mutated varieties were selected for field establishment.

Finger millet

The objectives of the finger millet breeding programme are to develop short age (75 - 85 days) and medium age (100 - 110 days) varieties having a potential yield of 3.5 t/ha.

Sorghum

- Two promising sorghum accessions were evaluated in VAT. These accessions showed average grain yields around 3.5 - 4.0 t/ha.

Sweet sorghum

- To develop varieties with high biomass and high Brix value population obtained from gamma irradiation was advanced to M5 generation level.

Foxtail millet

- Two promising Foxtail millet accessions were tested. These accessions showed average grain yields around 2.5 - 3.0 t/ha.

Popcorn

- The 3rd back cross population obtained to develop a high yielding popcorn population was advanced. The 4th back cross generation will be established in the field.
- Sixteen popcorn crosses were developed using the available locally developed inbred lines and the evaluation process will be continued.
- Fifteen inbred lines were developed using the available segregation populations. The lines were at S5 generation.

Grain Legumes

Mung bean

The objectives of the Mung bean breeding program are to develop high yielding (> 2.5 t/ha) and abiotic (water stress) and biotic (pests/ diseases) stress resistant/ tolerant varieties having 60 - 80 days of crop duration. Synchronized maturity is another aspect that is highlighted in the present crop improvement program.

- For developing high yielding varieties with desirable traits, new crosses were done using the selected parents evaluated in the previous seasons. All the F₁ seeds were established in the field and advanced to the F₂ generation. The F₂, F₃, and F₄ generations were maintained as the bulk population. The single plants were selected from the F₄ generation and selected plants were advanced to F₅

generation and planted as progenies. Seventy nine progenies with the desired characters were selected from the F₅ generation for the PYT.

- Yield and other parameters of the promising 19 Mung bean lines were evaluated. Six promising lines were selected for further testing.
- Adaptability and the stability of 2 promising lines were tested in 7 locations under NCRVT. They were selected for testing under VAT.

Cowpea

The main objective of the cowpea breeding program is to develop varieties having the average yields above 3.0 t/ha under irrigated and above 2.0 t/ha under rain fed conditions together with the other desirable traits such as tolerance/ resistance to pests and diseases.

- For developing high yielding varieties with desirable traits, new crosses were done using selected parents for high yields with the drought tolerance characters. Five F₂ and four F₃ populations selected from F₁ and F₂ generations respectively were established in the field as bulk populations for generation advancement. The progenies selected from two crosses in F₄ and three crosses in F₅ generations were advanced to the next generations.
- The PYT was conducted to test the yield and other parameters of 20 promising lines. Twelve lines were selected to test in the AYT in the forthcoming season.
- Four promising lines were evaluated in the NCVT trials for adaptability and stability in different agro-ecological regions. However, none of the lines performed better than the recommended varieties.

Black gram

The objectives of the black gram breeding program are to develop high yielding (average yields > 2.5 t/ha) and pest/ disease resistant/ tolerant varieties with short/ medium/ long duration.

- For the development of high yielding varieties with desirable traits, new crosses were made using the selected parents. Generations obtained from earlier crosses were advanced. Fifty eight lines with the desired characters were selected for testing in PYT.
- Yield and other parameters of the promising lines, (18 lines selected in Yala 2015) were tested.

Oil Seed Crops

Soybean

Objective of the Soybean breeding program is to develop the varieties having average yields above 5 t/ha under irrigated and 3 t/ha under rain fed conditions together with the other desirable traits such as determinate growth habit, large seeds and tolerance/ resistance to pests and diseases.

- Six F₄, three F₃ and eight F₂ populations were established in the field as bulk populations for generation advancement. Progenies selected from three crosses in F₅ generation were advanced to F₆ generation.
- Four Soybean lines received from AVRDC and two black seeded lines were evaluated in four locations to determine their adaptability and stability in different agro-ecological regions.
- Eight promising lines selected from germplasm evaluation of the lines

received from Michigan State University were evaluated.

- The plants with better characters compared to Pb 01 of M5 generation obtained by irradiating seeds of the variety Pb 01 with 50 kr, 100 kr, 150 kr, 200 kr and 250 kr strengths were selected to produce M6 generation.

Vegetables

- NCVT trials for Pumpkin promising lines coordinated by RARDC, Makandura and Brinjal promising lines coordinated by HORDI, Gannoruwa were conducted. The results were submitted to respective institutions.

Fruits

- Establishment and maintenance of the germplasms of Mango, Guava, Dwarf drumstick, Dragon fruit and Grapes were continued.
- Maintained the Dry Zone Field Gene Bank to conserve genetic resources of important Dry Zone perennial crop species. Two hundred and forty plants of sixty species were established and maintained.

AGRONOMY

- Mung bean, Chilli and Maize genotypes were screened on their ability to perform under low soil moisture regimes in the dry season. Among the forty and thirty tested Mung bean and Maize lines respectively in open environmental conditions, three Mung bean lines and two Maize lines performed better compared to the other tested lines under low soil moisture

conditions. Among the tested fifty-seven lines, three Chilli lines performed better compared to the other tested lines under low soil moisture conditions.

- A field experiment was conducted to test the impact of soil moisture stress (low soil moisture) at the flowering stage on the canopy temperature and pollen and spikelet fertility of rice. Canopy temperature increased when volumetric moisture content in the soil dropped to 16%. Consequently, the pollen, the spikelet fertility and the grain yield were affected.
- Sixteen recommended and five traditional rice varieties were screened on canopy cooling ability under water stressed (low soil moisture) condition with the objective to find out the genetic and the environmental variations in canopy cooling ability of rice. Water stress was imposed at reproductive stage up to “O” shaped leaf rolling appeared in at least three varieties including the check varieties; Bg 300 and Bg 358. The leaf dry weight, flag leaf and tiller angle, canopy height and number of tillers had a significant impact on the canopy cooling ability of rice in high temperature and drought stressed conditions.
- An experiment conducted to find out the effect of organic mulches on Big onion bulb yield revealed that the paddy straw mulch has a positive effect on bulb yield. The average bulb yield under paddy straw mulch was around 38 t/ha in Yala whereas, it was around 27 t/ha in Maha. Yield increments were around 32% and around 15% compared to unmulched condition in Yala and Maha respectively.
- Effect of micro and macro nutrients and plant growth regulators on growth and yield of Chilli were evaluated. It was found that there was no effect of micro nutrients when they were applied with organic matter. Although, the growth was promoted by the plant growth regulators, no significant impact on yield was observed.
- A study conducted with exotic and local maize hybrids proved that the plant density can be increased up to 74,074 plants/ ha at 45 cm x 30 cm spacing with a proportionate increasing of N application. The yield advantage was 20% - 25% compared to the present practice.
- An experiment was conducted to calibrate the Leaf Colour Chart (LCC) for seven Chilli varieties. According to the Cate and Nelson graphical method, the tested Chilli varieties (MI 2, KA 2, Galkiriyagama Selection, MI Green, MICH 3, Waraniya and MICH HY 1) should have a LCC value of 4 or above throughout the crop duration to give better yields.
- A study was conducted to test the effect of plant growth regulators on growth and yield of Chilli while additional nutrients were supplied through the Albert mixture as a foliar spray. Effects of growth regulators or Albert mixture alone were not seen by the plant dry weights. Effect of Albert mixture alone was not expressed by the green Chilli yields. However, when the plants were supplied with additional nutrients, the effect of plant growth regulators was significant.

CROP PROTECTION

Pathology

- An experiment was conducted for identification of Onion black mold complex. Big onion flower samples with mold symptoms were collected from 21 farmer fields. The pathogen was confirmed as *Aspergillus* spp. in Onion flower as Onion bulb causing black mold. Bulb inoculation using *Aspergillus* isolated from onion flowers and black mold infected onion bulbs was done and similar onion black mold symptoms were observed. *Trichoderma* was isolated from soil samples collected from the Onion fields. Antagonism studies showed that the *Trichoderma* effectively controlled *Aspergillus* spp.
- Eleven onion exotic lines were evaluated for anthracnose with the check varieties Dambulla Selection and Vethalan. All the lines showed highly susceptible/susceptible reactions for anthracnose disease.
- Ten promising local Chilli hybrids were tested for CLCV in Maha 2016/17 and Yala 2017 with the check varieties Vijaya and MICH HY 01. All the ten lines showed Moderately Resistant reactions for CLCV.
- Nine Chilli lines were tested for CLCV in Maha 2016/17 and Yala 2017 with the check variety MICH 03. Out of nine lines, eight lines showed moderately resistant reactions whereas the other showed moderately susceptible reactions for CLCV.
- Ten Finger millet lines were tested in Maha 2016/17 for the Finger millet Blast

disease with two recommended check varieties; Oshada and Rawana. Out of ten lines tested, two lines showed comparable results with the Moderately Resistant line Oshadha.

- Pilot scale trial conducted in Maha 2016/17 in farmers' fields in Dambulla to test the efficacy of Azoxystrobin 250 g/l SC to control the Anthracnose and Purple Blotch of onion proved that Azoxystrobin 250 g/l SC was effective in controlling Anthracnose and purple blotch.
- A trial was conducted to retest the efficacy of fungicides against Anthracnose and Purple Blotch of onion to proceed the re-registration process. Tryfloxystrobin 250 + Tebuconazole 500 g/kg WG and Fluazinam 500 g/l SC were identified as effective whereas Chlorothalonil 75% WP was not effective against Anthracnose and Purple Blotch of onion.

Entomology

- Eight local Chilli hybrids were evaluated for pest damages along with exotic hybrid Wijaya and local hybrid MI CH HY 01 under unsprayed conditions. Severity of thrips damage was lower in all the tested new hybrids and MI CH HY 01 (15% - 24%) compared to the variety Wijaya (39%). Virus incidence was higher in the variety Wijaya (68%) than that of the local Chilli hybrids (7% - 16%).
- Nine open pollinated Chilli lines were evaluated for pest damages along with the recommended variety MICH 03. Severity of thrips damage was lower in 2 lines (severity index - 22 and 38) compared to the variety MICH 03

(severity index - 69). Percentage of virus incidences was lower in all the tested lines (0 - 28%) compared to the variety MICH 03 (56%).

- Twenty-six exotic Chilli hybrids were evaluated along with the local Chilli hybrid MICH HY 01 and Galkiriyagama Selection for the pest damages during Maha 2016/17 under sprayed conditions. Severity index of thrips damage ranged from 17 - 42 in all the tested Chilli hybrids. Further, the percentage of mites damaged plants ranged from 0 - 17 % in all the tested Chilli hybrids.
- Nineteen exotic Chilli hybrids were evaluated along with the local Chilli hybrid (MICH HY 01) for the pest damages in Yala 2017 under sprayed conditions. Severity index of the thrips damage ranged from 13 - 34 in all the tested Chilli hybrids. The percentage of the mites damaged plants ranged from 0 - 44% in all the tested Chilli hybrids.
- Effect of different mesh sizes (50 and 40 mesh) of nylon nets to control Chilli Leaf Curl Complex was studied. Aphids and virus damages were high in plots covered with nylon nets compared to the control treatment.
- Effect of plant extract (Synkromax Synkoviron) to control Chilli Leaf Curl Complex was studied and found that the plant extract alone was not effective in controlling Chilli Leaf Curl Complex.
- Effect of intercropping maize with different legumes to control the stem borer in Maize was studied. Stem borer damage was low in Maize plots intercropped with cowpea and Mung

bean compared to the control (Maize alone) plots.

- In Maha 2016/17, the percentage of stem borer damaged plants varied from 13% - 37% in all the tested Maize hybrids grown under unsprayed conditions. The percentage of stem borer damaged plants was 28% in MI Maize HY 01 and that was 19% in MI Maize HY 02. However, in Yala 2017, the stem borer damage was very high in all the tested Maize hybrids (60% -76 %) under unsprayed conditions.
- Twenty Mung bean lines were evaluated for pest damages along with 2 recommended varieties (MI 6 and MI 5). Results showed that all the promising lines tested except one was susceptible to pod borers damage (damage > 38%).
- Twelve Black gram lines were screened against pod borer damage and found that all the tested lines were susceptible to pod borer damage.
- The sampling was completed for a study initiated to identify the biotypes of BPH in rice in Galle, Matara, Hambantota, Kalutara, Anuradhapura and Kurunegala Districts. Morphometric and molecular analysis will be done.

Weed Management

- Five herbicides were screened to evaluate the weed controlling ability and phytotoxicity as non-selective pre-plant herbicides. 1, 8 Cineole (Q Star) SC, Avenger AG Burn Down and Beloukha VVH 86086 were not effective in controlling weeds. Although, Imazapyr-isopropyl NH₄ salt 27.6% W/W (Polaris) and Imazapyr 25% SL controlled the

weeds as post emergence herbicides, the residual effect was very high showing strong phytotoxicity in the crops. No weed emergence seen even after 3 months showing the high residual effects of the tested chemicals.

SOIL FERTILITY

- Maize is one of the Other Field Crops that use higher inorganic Nitrogen (N) fertilizer. The frequently used N fertilizer source is Urea. However, N fertilizer use efficiency of Urea is very low. Hence, there is a need to identify A demand driven N fertilizer application strategy where, Leaf Color Chart (LCC) could be used to decide the amount and the time of N fertilizer application. Critical LCC value was identified as 4.5.
- Studies were initiated to revise the fertilizer recommendation for Big onion and the experiments will be repeated in few more seasons prior to give recommendations.
- Studies were conducted to investigate the effect of micro nutrients on Mung bean and the experiments will be repeated in more seasons prior to give recommendations.

WATER MANAGEMENT

- The experiment with the objectives to modify the traditional alley cropping system with wider alley spacing to reduce the occupation of cultivable land by hedge rows and incorporation of irrigation system to provide supplementary irrigation in order to increase the crop productivity and to avoid the drought

stress was continued in 2017 as well. Result revealed that the alley cropping systems with sprinkler irrigation and lopping increased the seed yield of green gram by 38 - 45% compared to the non-alley with sprinkler irrigation. It was found that the average temperature is reduced by 1.5 and 1°C in Yala and Maha respectively with the treatment combination of alley and sprinkler irrigation without lopping. The modified alley system so far proved that it can be adopted to reduce temperature and to increase the productivity.

- A series of experiments initiated in 2016 to develop an agronomic management package suitable to increase the crop productivity of Chilli and Mung bean using micro irrigation were repeated in 2017. Chilli was tested under the drip irrigation-based packages while Mung bean was tested under the sprinkler irrigation-based packages. Mulching with paddy straw, amendment of organic manure and split application of fertilizer were applied as packages under the drip and the sprinkler irrigation systems. Fertigation was also practiced with drip irrigation. Studies showed that yields of green Chilli and Mung bean can be increased up to 45 t/ ha and 2.5 - 3 t/ha respectively under the micro irrigation systems while reducing the irrigation water consumption by around 30 - 50% compared to the surface irrigation.

BIOTECHNOLOGY

- A study initiated to evaluate Chilli accessions for anthracnose resistance proved that *C. capsici* and *C. gloeosporioides*. Are

causal organisms Both species equally damage the host. Arunalu and MI Hot showed the lowest susceptible reaction in the susceptible range. Further, the Polymerase Chain Reaction was completed using resistant gene analog primers to detect the resistant genes in *Capsicum annum*.

- Chilli Leaf Curl (CLC) is the most devastating disease in Chilli causing yield losses up to 100 %. However, no resistant sources have been identified. Therefore, a study was initiated to develop an appropriate method to develop a resistant/ tolerant Chilli line/s for CLC viruses.
- A tissue culture protocol for regeneration of tobacco was developed. Tissue culture plant regeneration protocol was optimized for the Chilli variety, California Wander. Confirmation of the presence of virus by PCR was done. Primer designing was completed to amplify siRNA generating sequences from AC1 reagent.
- Quality Protein Maize (QPM) is the product of improved two genotypes by incorporating modifier genes that convert the undesirable soft and chalky kernel to the hard endosperm. The opaque - 2 gene mutation and the modifiers/ enhancers of Lysine and Tryptophan are not sufficient to develop agronomically acceptable maize which is high in Lysine and Tryptophan. Marker assisted selection has been incorporated to accelerate the breeding cycle of QPM.
- Incorporation of the Opaque - 2 - gene into non QPM lines is desired to convert QPM line/ variety to develop QPM varieties. Molecular markers could be used to identify the proper varieties/ lines. Selected two lines of (CML 20/ 193, 164/ CML 20) population were advanced to BC₂F₂ population by

doing selfing. Molecular screening was done to 210 plants of the CML 20/ 193 cross combination. QPM incorporated 30 lines were identified. QPM incorporated lines were advanced to BC₂F₆ population by selfing. Morphologically homozygous inbred lines were selected for PYT. Selected 30 lines were back crossed with CML 20 to form BC₄F₁. The population of BC₄F₁ was advanced to BC₄F₂.

- An experiment was initiated to develop a micro propagation protocol from important grape varieties available in Sri Lanka through seed/ shoot culture due to the unavailability of planting materials for vegetative propagation. C2D medium with 0.5 mg/l BAP was identified as the culture initiation medium and C2D medium with 5 μM BAP and GA3 0.2 mg/l identified as the appropriate medium for shoot multiplication. Further, a rapid shoot multiplication protocol was developed for Sonaca seedless grape variety using C2D liquid medium with 0.5 mg/l GA3, 0.4 mg/l BAP and 0.01 mg/l NAA. The shoot multiplication was obtained within 2 - 3 weeks.
- A study was initiated to screen the Mung bean lines/ varieties for bruchid resistant gene (Br1) aiming at expediting the process of development of bruchid resistant new lines/ varieties. Mung bean DNA extraction protocol was optimized and the PCR amplification is in progress to identify the bruchid resistant Mung bean lines and Yellow Mosaic virus resistant lines.

SEED PRODUCTION

supplied to SPMDC and other relevant organizations (Table 1.1.3).

Following quantities of breeder and registered/ certified/ commercial seeds were produced and

Table 1.1.3: Quantities of breeder and registered/ certified/ commercial seeds produced during 2017

Crop	Variety	Quantity (kg)	
		Breeder seeds	Registered/ Certified/ Commercial seeds
Maize	Ruwan	39.0	-
	Bhadra	55.0	-
	CML 161	755.0	-
	CML 194	164.0	-
	CML 451	70.0	-
	CLO 2450	55.0	-
	MI Maize HY 1	-	350.0
Finger millet	Rawana	37.0	-
	Oshada	38.0	-
Popcorn	MI pop corn	-	64.0
Sweet sorghum		-	100.00
Chilli	Galkiriyagama inbred line	1.44	-
	MI Waraniya 1 inbred line	1.85	-
	MICH 3	3.59	-
	MI 2	2.0	-
	MI Waraniya 1	2.14	-
Mung bean	Ari	11.0	-
	MI 6	72.5	-
Big onion	MIBO 1	7.0 (True seeds)	-
Black gram	MI 1	29.0	-
	Anuradha	44.0	-
Soybean	Pb 1	185.0	-
Cowpea	Dhawala	16.0	-
	MICP 1	37.0	-
	Waruni	77.0	-
	Bombay	22.0	-
Snake gourd	MI short	2.0	-

TECHNOLOGY DISSEMINATION

- FCRDI officers participated as resource personnel in over 175 training programs conducted on Other Field Crops (OFC) production for officers, farmers and for school, university and Technical College students with a total number of participants over 5,000.
- Officers participated in over 100 field visits and 5 Plant Clinics with the Agriculture Extension staff
 - Technical advices were provided for over 2,500 clients who visited the institute and over the telephone.
 - About 250 of leaflets on technical information were distributed.
 - Around 1400 soil samples were tested under the program implemented to give a Grama Niladari Division based fertilizer recommendation for rice. In addition, about 100 soil samples were tested on the requests of farmers and extension officers for the site-specific fertilizer recommendations for different crops.
 - Around 48 kg of OFC seeds were issued free of charge for farmers and other organizations.
 - FCRDI officers participated as resource persons in fifteen radio programs on OFC cultivation and related topics.

OTHER

- Three Undergraduate students completed the final year research projects at the institute.
- Fourteen Technical College students completed their 6 months in-plant

training at the institute. Further, 9 National Youth Service Council students and 8 School of Agriculture students completed the 6 months in-plant training at the institute.

- Existing laboratories were upgraded and laboratory equipment and field machinery were purchased under the Hybrid Development project.
- Following activities were conducted under the KOPIA TCP project – ‘Seed multiplication and cropping technology development for onion varieties in Sri Lanka’.
 - Big onion seed production in seed production model villages at Galenbindunuwewa in Anuradhapura District, Liyangastota in Hambantota District and Tharawankotte and Sinnakkarasi in Mannar District - A total of 1,414 kg of Big onion seeds was produced in 1 ha of lands (under rain-shelters) in Galenbindunuwewa onion seed production model village in Maha 2016/17.
 - Construction of rain shelter facilities in 3 ha of lands and store houses having the capacity to store 90 t of onion mother bulbs.
 - Distribution of plastic crates for mother bulb transportation, drip irrigation systems, agrochemicals, power sprayers and other small tools.
 - Expansion of Galenbindunuwewa model village up to 2 ha.
 - Establishment of a new onion seed production model village in Bulnewa area in ‘Mahaweli System H’.

PLAN FOR 2018

Research

- Crop improvement and variety development of other field crops
- Development of technologies to control pest and diseases in other field crops
- Effective utilization of biotechnology tools in crop improvement
- Development of soil management technologies for other field crops
- Development of techniques to enhance the water productivity in the Dry Zone
- Conducting studies on climate change on productivity of other field crops
- Development and identification of fitting vegetable and fruit crops/ varieties for the Dry Zone

Development

- Production of breeder seeds of the recommended other field crop varieties
- Dissemination of agriculture technology to stakeholders

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	01
Principal Agriculture Scientists (Entomology)	01
Assistant Director of Agriculture (Research)	15
Assistant Director of Agriculture (Development)	01
Assistant Director of Agriculture (Agric. Economics)	01
Administrative Officer	01
Program Assistant (Agriculture)	02
Development Officer	01
Agricultural Instructor	04
Research Assistant	20
Public Management Assistant	11
Technological Assistant	03
Farm Clerk	01
Driver	07
Storeman	01
Mechanist	03
Technician	01
Research Sub Assistant	09
Circuit Bungalow Keeper	01
Lorry Cleaner	01
Office Employee	01
Watcher	24
Laborer (Permanent)	289
Laborer (Contract)	25
Total	425

1.1.1 GRAIN LEGUMES AND OIL CROPS RESEARCH AND DEVELOPMENT CENTRE (GLORDC) - ANGUNAKOLAPELESSA

Grain Legumes and Oil Seed Crops Research and Development Centre comes under the preview of FCRDI is the main agriculture research centre located in Southern Dry Zone. It is mainly focusing on the research and development programs of grain legumes, oil seed crops, regionally important vegetable and fruit crops. It also involves with transfer of technology to along with its satellite station at Weerawila in DL₅ agro-ecological region. All the research programs are planned based on

both national and regional research needs in the thematic areas of crop improvement, agronomy, plant protection, water management, soil science and food science.

In addition, the centre involves with the production of breeder seeds and basic planting materials of released varieties, recommendations on site specific fertilizer application and dissemination of technical information to field officers, farmers and other interested people.

BUDGET

Table 1.1.1.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	14,409,907	12,203,335	85
Capital	8,100,000	7,900,439	98
Projects			
• NARP			
○ Detection and management of virus like diseases in Cucurbits, Legume and Chilli in the Southern Dry Zone region	205,000	205,000	100
○ Development of technological package for the sustainability of rainfed Finger millet cultivation	246,500	224,546	91
○ Collection, establishment and evaluation of Wood apple germplasm from Dry and Intermediate Zones	2,694,500	2,578,432	96
• Fruit Production Village Program			
○ Citrus diversity collection and evaluation	2,600,000	2,554,336	98
○ Establishment of Mango orchard	1,492,500	1,492,500	100

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
○ Production of 10,000 grafted Wood apple plants in fruit village project	500,000	471,973	94
● 55 million Project	2,770,000	2,741,462	99
Total	33,018,407	30,372,023	92

PROGRESS

AGRONOMY

- Completed the trial on effect of Absciscic acid and drought stress on Groundnut (*Arachis hypogea* L.). Groundnut per plant, seed weight and filling percentage was not significantly different with the drought effect in the treatments of seed soaking with Absciscic acid and foliar application of Absciscic acid compared with the control.
- Conducted the trial on application of different techniques to improve the quality parameters of indeterminate Sesame. Concentration gradients of salt, ethrel, urea were compared with 0.5 mol m⁻² concentration of salt to identified the best technique for defoliation and desiccation of Sesame plants. The 0.5 mol m⁻² salt application was the effective treatment for defoliation and decication of sesame at maturity.
- Conducted a trial on evaluation of intercropping systems of maize with legumes. Maize yield was not significantly different with the treatments of sole crop Maize and Maize intercropped with Soybean, Kollu and Groundnut.
- Growing Degree Days (GDD) requirements of local sesame varieties were calculated in different planting time.
- Development of techniques to increase seed longevity and viability problems associated with Groundnut, curing effect was evaluated.
- Conducted a trial of drought screening of CYMMIT lines of Maize. Collected data have forwarded to the trial coordinator for further analysis.
- Conducted farmer field trials with the focus of developing a technological package of practices for sustainability of Finger millet cultivation under rainfed farming systems. Tested the effects of row sowing, compost application and application of recommended dosage of inorganic fertilizers on yield. Found that the yield can be enhanced by continuous use of compost. And 23% yield enhancement can be obtained by practicing row sowing and chemical weed controlling. Research is ongoing.
- NCVT trials were conducted on Groundnut, Sesame, Mungbean, Cowpea, Hybrid Chilli, Hybrid Maize, Soybean and Finger millet. Collected data were forwarded to the relevant co-ordinators for further analysis.

PLANT BREEDING

(CROP IMPROVEMENT)

Oil Seed Crops

Groundnut

- Groundnut variety improvement: F₂-7 different lines, F₄-6 different lines, F₅- One line, F₇- 6 lines selected for further evaluation.
- Preliminary yield trials of short duration Groundnut lines were completed and continuing to major yield trial.
- NCVT of high yielding, medium duration and large seeded groundnut lines is completed for the season and continuing for next season.
- NCVT of high yielding, short duration Groundnut line is completed for the season and continuing for next season.

Sesame

- Conducted research trials to develop high yielding, high oil content, disease tolerant determinate type white/black seeded sesame varieties. Under this program advanced hybridized in F₅ generation.
- Preliminary yield evaluation of selected five lines with three check varieties were conducted to develop high yielding, high oil content, disease tolerant determinate type white/black seeded Sesame varieties.
- Selected 3 sesame lines were evaluated in VAT program.
- Purification of Variety MI3 and MI1 is continuing.

Soybean

- Comparatively better results were not showed by two selected promising lines (AC 2133, AC 2514) tested in NCVT.
- Another 4 promising lines were nominated in Preliminary Yield Trial.

Grain Legumes

Mungbean

- Generation advancement of F₄, F₅ & F₇ were carried out to develop high yielding (>3 t/ha), pest and disease tolerant Mung bean varieties for seasonal cultivation.
- Four lines (ANKMB 41, ANKMB117, ANKMB118, ANKMB121) evaluated in NCVT to develop high yielding (2 t/ha), pest and disease tolerant varieties for catch cropping.
- One Mung bean line (ANKMB 48) evaluated in VAT.
- Evaluation of Mung bean germplasm for drought tolerance is in progress.

Cowpea

- ANKCH1 tested Cowpea line was released as ANKCP2 variety in Variety Release Committee (VRC) meeting 2017.
- Four cowpea lines were identified as high yielding medium duration and tested in National Coordinated Varietal Testing trials (NCVT) in one season
- CP220 and CP128 cowpea lines were identified as comparatively high drought tolerant accessions and tested in National Coordinated Varietal Trials (NCVT).
- Four medium duration and five short duration cowpea lines were tested under major yield trials .

VEGETABLES

Thumba karawila

- Forty eight germplasm accessions were maintained successfully as a field gene bank.

Ela batu

- Preliminary yield evaluation was conducted with eight lines to testing yield performances.

Okra

- NCVT was conducted two selected lines and two check varieties.

Red Onion

- Selected two lines were evaluated with four check varieties in Preliminary yield trial to develop large size bulb, early maturity (< 75 days) cluster onion line through conventional breeding.

FRUIT CROPS

Wood apple

- Maintained wood apple gene bank with 156 accessions with the extent of 25 acres
- New accessions from Northern region were collected, grafted and prepared land for the establishment
- Floral characters, yield and fruit quality data recorded and analyzed

Beli

- Maintained Beli gene bank with 23 accessions with the extent of 1.5 acre land

Mango

- Rejuvenation study of Mango older trees completed and analyzed the collected data.
- Studied the outer canopy ball pruning and high density planting of mango. Three ball pruning cycles completed and trees developed with desirable canopy structure.
- Collected and established 156 mango accessions with local and exotic origin for varietal improvement
- All infrastructure facilities developed for the mango research orchard in 12 acres land.

Banana

- Evaluation of yield characters completed for 4 seasons. One 'Embul' banana accession and one 'Seeni kesel' accession were selected as promising and established for major yield trial

Citrus

- There were 356 accessions collected and established, including Orange, Sour orange, 'Heen naaran', 'Jambola', 'Gada dehi', 'Nas naaran', Mandarine and 'Sedaran'.
- Growth parameters recorded and maintained the orchard

Papaya

- Established and evaluated local Papaya hybrids in NCVT
- Six Papaya lines were selected with Papaya Ring Spot Virus (PRSV) disease tolerant characteristics and good quality and quantity yield characteristics in yield evaluation trial.

SOIL SCIENCE

- Evaluated the effect of gypsum application on yield and seed filling of large seeded Groundnut under irrigated condition in RBE soil. There is no significant influence of gypsum application up to 100 kg/ha in basal application on yield of Groundnut in RBE soil in two consecutive seasons.
- Fine tune the fertilizer schedule for yield and seed filling enhancement of large-seeded Groundnut under irrigation condition. Some treatments showed significant differences compared to DOA recommendation.

FOOD SCIENCE

- Conducted experiments on Nutritional comparison and health benefits of popular pulse varieties grown in Sri Lanka. Horse gram is a good source of most of the mineral such as Fe, Zn and Ca. Mung bean variety MI 6 contained the highest phosphorus content compared to the all other pulse varieties in Sri Lanka. All the pulse varieties Predicted Glycaemic Index value were lesser than 50.
- Vege-fingers were developed using Soybean, Mung bean and Groundnuts. Development and evaluation of vege fingers by using different formulations of pulses and oilseed pulps was carried out. Nutritional composition and sensory evaluation results showed the best formulation for the vege finger contained 40% Soybean, 20% Mung bean, 20% Groundnut and 20% other ingredients. Its nutritional composition was 13.69%

carbohydrates, 27.05% Fat, 9.25% protein and 2.49% minerals.

PATHOLOGY

- Under *in-vitro* mutageneses of banana for Fusarium wilt (*Fusarium oxysporum* f.sp. cubense (Foc)) resistance/tolerance program 3366 tissue-culture derived plantlets were screened under double tray technique and 1198 plantlets were screened under sick plot. The 2125 plantlets were dead in double tray and sick plot.
- Detection of virus and virus like diseases in Cucurbits, Legumes and Chilli in the Southern Dry Zone was carried out. Soybean, Cowpea, 'Thumba' and Cucumber 200 samples were screened. Two new viruses (Water melon chlorotic stunt virus and Cucurbit aphid borne yellow virus) were identified in Cucurbits.

ARS, WEERAWILA (DL₅)

- Conducted trials to determine the effects of different Mulch on the yield and productivity of big onion in DL₅ Agro ecological region. Among polethene mulches black polethene showed better effect and among organic mulches straw was the best. Two seasons completed and need to continue another season to confirm the results.

TECHNOLOGY TRANSFER AND TRAINING

TV Programs

- Mr. B.N. Samaranayake participated for a TV program on released legume

varieties by GLORDC, Angunakolapelessa.

- Mr D. Weerasekara participated for 03 audio visual programs on Spine gourd crop.

Radio programs

- Mr D. Weerasekara participated for two radio program with ‘Ruhunu Sevaya’ (Ruhunu gewaththa) on vegetable cultivation.
- One radio program was conducted in ‘Ruhunu Sewaya’ on diseases of grain legumes and oil crops.

Training programs

- Eighteen pre-seasonal training programs were conducted for technical officers in agriculture extension service in Southern province.
- Provided necessary advice and recommendations to about 87 farmers who visited the centre seeking information.
- Conducted a training for new Technical staff members on Sesame cultivation.

Services provided

Soil, Compost and Water testing program

- 890 soil samples from farmer fields were analyzed and fertilizer recommendations were provided.
- 20 water samples and 20 compost samples were analyzed for quality.
- 27 field visits were made by the officers to solve site specific regional problems.

Special achievements / Awards

- Ms. D.G.C. Jeewanie has completed Ph.D. and graduated from Northwest Agriculture and Forest University, China.
- Conducted a ‘Research Field Day’ on 15 December 2017 at GLORDC, Angunakolapelessa with the participation of the Secretary to the Ministry of Agriculture, State Secretary to the State Ministry of Agriculture, Additional Secretary of the Ministry of Agriculture, Director General of Agriculture, Directorate and other institutional heads with all officers.

PLANTING MATERIAL

PRODUCTION

Vegetables

- 2,476 plantlets were produced as basic planting materials of recommended ‘Thumba’ varieties.

Fruits

- 5,000 grafted Woodapple plantlets were produced.

Seed Production

Table 1.1.1.2: Produced amounts of seeds in the year 2017

Crop	Variety	Type	Quantity (kg)
Groundnut	Tissa	Breeder's seed	288
	ANKG 1	Breeder's seed	62
	ANKG 2	Breeder's seed	391
	Mixed Groundnut	Consumption	1549
Sesame	Uma	Breeder's seed	6.26
	Malee	Breeder's seed	2
	Mixed Sesame	Consumption	12
Cowpea	ANKCP 1	Breeder's seed	20
	Mixed Cowpea	Consumption	352.5
Horse gram	ANKK Black	Breeder's seed	03
	ANKK Brown	Breeder's seed	03
	Mixed Horse gram	Consumption	61
Mung bean	Mixed Mung bean	Consumption	56.5
	Mixed Mung bean	Consumption	56.5
Soy bean	Mixed Soybean	Consumption	45
Maize	Mixed Maize	Consumption	659.5
Ruhunu Miris	Seeds	Multiplication	5

DEVELOPMENT ACTIVITIES

- Land development conducted about 12 acre lands for the establishment of fruit orchards.
- Field nursery building with stores and net house constructed with the support of Mango project and internal resources.
- Bio diversity garden of fruit crops was developed with the extent of 10 acres and with 90 fruit types for the conservation of fruit genetic variations.

PLAN FOR 2018

- Development of crop management practices for other field crops
- Development of high yielding, medium duration, large seeded groundnut varieties for industrial and general consumption purposes
- Development and improvement of grain legume crops with special reference to Mung bean, Cowpea and Horse gram for high yield, quality and pest & disease resistance.
- Development and Improvement of sesame varieties for industrial and consumption purposes

- Soil fertility management studies with special reference to oil seed crops and pulses.
- Development of environmentally friendly and cost effective pest and disease management methods for oil seed crops and pulses.
- Development of economical and consumer preferred food processing techniques for oil seed crops, pulses, regionally important fruits and Maize.
- Development and Improvement of regionally important vegetable crops.

ARS, Weerawila

Designation	No. Existing
Assistant Director of Agriculture (Agric. Research) - In Charge	01
Development Officer	01
Research Assistant	02
Technological Assistant	01
Driver	01
Tractor Operator	01
Watcher	04
Laborer (Permanent)	13
Laborer (Contract)	04
Total	28

STAFF LIST

GLORDC, Angunakolapelessa

Designation	No. Existing
Additional Director	01
Assistant Director of Agriculture (Research)	14
Assistant Director of Agriculture (Agric. Economics)	01
Administrative Officer	01
Economist Assistant	01
Development Officer	03
Farm Manager	01
Research Assistant	10
Public Management Assistant	06
Technological Assistant	03
Driver	07
Tractor Operator	02
Circuit Bungalow Keeper	01
Office Employee	01
Watcher	15
Laborer (Permanent)	156
Laborer (Contract)	35
Total	258

1.1.2 REGIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE (RARDC) - ARALAGANWILA

Regional Agricultural Research and Development Center (RARDC), Aralaganwila comes under the purview of Field Crops Research and Development Institute, Mahailuppallama. Other field crops research and development is the main focus of the station. Rice, fruits and vegetables are considered as regional mandates. Crop improvement program of the station mainly focused on cluster onion and spine gourd varietal development.

Other research programs are focused on improvement of crop management practices, crop protection, plant nutrition and water management.

RARDC, Aralaganwila is the only station situated in Non Calcic Brown soil group under DL_{2b} agro ecological region and provide technical guidance to Eastern region and Mahaweli systems B, C & G.

BUDGET

Table 1.1.2.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	7,430,466	6,589,767	89
Capital	5,105,000	4,877,512	96
Projects			
• Papaya breeder seed production	500,000	491,740	98
• Development of hybrids and Open Pollinated Varieties of Chilli, Maize and Onion (Recurrent)	1,620,000	1,123,666	69
• Soil test based fertilizer recommendation program for Grama Niladhari divisions	200,000	199,722	100
Total	14,855,466	13,282,407	89

PROGRESS

VARIETAL IMPROVEMENT

Cluster onion

- The morphological & quality characterization of 60 accessions were continued. Two short duration accessions (60 -75 days), ACA 56 and ACA 13 were evaluated under Varietal

Adaptability Trial with two recommended check varieties; Thinnavelly Red and Jaffna Local. ACA 56 at Thelulla and Kalpitiya performed well than the others in 2016/17 Maha and 2017 Yala. ACA 13 was performed well at Trincomalee in 2017 Yala.

- Four bolting lines, ACA 67, ACA 68, ACA 81 (line number 15) & ACA 82 (line

number 17) with Vethalan (check) were evaluated under NCVT in 2016/17 Maha. ACA 81 performed well at Aralaganwila in 2016/17 Maha but at the end of the season crop was damaged due to rain. All the four lines performed well than the check at Thirunelvely in 2016/17 Maha. Bulb multiplication was done in 2017 Yala.

- Twelve cluster onion lines with high yielding and good appearance were evaluated under Major Yield Trial (MYT) in 2016/17 Maha and 2017 Yala. MYT was damaged due to rain in Maha season. ACA 83 (15.9 t/ha) got highest yield in Yala season. F₁ bulbs of interspecific hybridization were harvested and they were planted to multiplication and evaluation.

AGRONOMY

Papaya

Effect of seasonal variation and crossing method were studied on seed formation of 'Ratna' papaya. Pollination method and prevailing weather conditions especially maximum, minimum and relative humidity have no significant effect for the fruit weight, number of filled seeds and number of empty seeds.

'Ratna' papaya breeder's seed production field was established and 5 kg of breeder's seeds were produced.

Dragon fruit

An experiment was started to evaluate different training and pruning methods in dragon fruit. Only a few fruits were harvested in this year. According to available data, there

is no significant effect of number of plants and number of branches for the emergence of primary and secondary branches and number of flowers.

Mango

Forty-six mango accessions were maintained in the station and evaluation was carried out by collecting quantitative and qualitative yield data. Among those ACC 51, 28, 8, 14 and 15 were received highest preference in sensory evaluation. Data collection will be continued.

Cluster onion

- Vernalization is a costly and time consuming process in onion seed production. Therefore, different rates of nitrogen fertilizer and GA3 application were evaluated for the bolting of non-vernalized cluster onion. But tested levels of nitrogen and GA3 have no significant effect on flowering on non-vernalized red onion.
- Bio-charcoal and organic matter are important soil amendments to improve conditions of degraded soils. Therefore, application of bio charcoal and organic matter were evaluated for the performances of cluster onion in NCB soils. None of the tested levels gave significant results in cluster onion.

Rice

Four lines of 3.5 months maturity classes and five lines of 3 months maturity classes were tested at Aralaganwila which was coordinated by RRDI, Batalagoda. In Maha season 3.5 months maturity class, check variety At 362 (7.5 t/ha) got highest yield than the selected

and other check varieties (BG 352, At 373, BG 366). Breeding line At 13-1543 (7.3 t/ha) of 3 months maturity class got highest yield than the check varieties (BG 300, At 309, At 311) in Maha season and At 13- 3048 (13.7 t/ha) showed highest yield in Yala season. In 3.5 months maturity class check variety BG 352 and BG 14-567 (15.4 t/ha) got highest yield in Yala season. Not significant yield difference showed in 3.5 months maturity class.

Cowpea

From ten Cowpea lines (drought tolerant) ANKCP 1 and MICP 2009-4(2.7 t/ha) got higher yield than check variety Waruni (2.5 t/ha), Dhawala (2.4 t/ha) and MICP 1(2.6 t/ha) in Maha season at Karadiyanaru under rain fed condition and check variety Dhawala (2.8 t/ha) got highest yield under irrigation condition. MICP 2009-1 (1.9 t/ha) got the highest yield in Yala season under limited water condition and check variety Dhawala and MICP 2009-4 got the highest yield (2.7 t/ha). Eight lines which was coordinated by GLORDC, Angunakolapelessa was evaluated and yield was not significantly different in Yala season.

Mung bean

Eight lines of Mung bean were tested under NCVT which was coordinated by FCRDI, Mahailuppallama and GLORDC, Angunakolapelessa. MIMB 14254 and check variety MI 5 got the highest (0.6 t/ha) yield in 2016/17 Maha season. Ten lines were tested in Yala season but there were no significant difference in yields.

Groundnut

Five lines of large seeded and four lines of short duration Groundnut were tested under

NCVT which was coordinated by GLORDC, Angunakolapelessa. Large seeded, ANKG 2 (2.3 t/ha), ANKG 7(2.2 t/ha) and check variety Walawa (2.3 t/ha) got highest yield and short duration line, ICGV 2742 (2.2 t/ha) got highest yield in Maha season. ANKGL 2742 (1.8 t/ha) and ANKGL 6 (1.7 t/ha) got highest yield than check varieties in Yala season.

Soybean

Ten lines of soy bean were tested under NCVT which was coordinated by FCRDI, Mahailuppallama and GLORDC, Angunakolapelessa. MISB 2, line number 2542 and check variety, PB 1 got the highest yield (1.5 t/ha) in Maha season and check variety MISB 1 (1.3 t/ha) got the highest yield in Yala season.

Underutilized crops

Thibbatu

Plant establishment for breeder seeds were not accepted due to closed establishment of another Thibbatu trial. Field evaluation of Thibbatu propagation method is going on.

Spine gourd

A study was initiated to evaluate the effect of shade nets with different levels for the performances of spine gourd in Dry Zone conditions. Flowering data, temperature and light levels are being measured. Experiment is continuing.

Studying of hermaphrodite flower development was continued.

PLANT PATHOLOGY

- Fungal diseases are a major problem in growing cluster onion. For the main

fungal diseases (Purple blotch, Anthracnose and Fungal bulb rot) 46 cluster onion lines were screened and selected lines were used for further multiplication. Molecular identification is in the process.

- Leaf eating caterpillars, Thrips, bulb mites are the major pests and Purple blotch, Anthracnose, Fungal bulb rot, Bacterial bulb rot, Downey mildew are the major diseases of onion cultivation in Sri Lanka. Damage for the crop from above pest and diseases varies with different climatic conditions. With collected data of pest and diseases and climatic parameters, cropping calendar will be developed for Mahaweli system B. Data analysis and cropping calendar development is in progress.
- Crop damages from pest and diseases vary with different climatic conditions. Considering main pest and disease problems for Groundnut cultivation a crop calendar will be developed for Mahaweli system B for Groundnut using pest and disease data and climatic data. Data collection is in progress.
- Twenty one Groundnut lines were collected throughout the country and screening for major diseases, morphological and quality characteristics were continuing.

SOIL SCIENCE & WATER MANAGEMENT

- Long term combine applications of organic and inorganic fertilizer on paddy yields are studying for more than 25 years. In the study of application of chemical fertilizer and organic matter in situ (Rice-

legume rotation), green manure with chemical fertilizer application gave the highest yields (3.7 t/ha). Application of chemical fertilizer and organic matter ex situ (Rice-rice rotation) experiment showed that cattle manure with crop residue application gave comparable yields as chemical fertilizer application (Yield > 6 t/ha).

- A study is continuing to assess the impact of climate change on maize production in Sri Lanka: Model calibration and validation completed.
- Bg 357 and Bw 361 varieties recorded highest yields (>6 t/ha) without applying fertilizer in Non- calcic brown soil in the study screening paddy varieties for low fertility conditions.
- A study was initiated to test the effect of applying super moisture absorbents to increase water use efficiency in red onion. Results showed no significance difference among treatments from zero to 50 kg/ha. Therefore study is continuing with increasing rates.
- A study was conducted to test the effect of water logging conditions on maize. Results showed that water logging conditions at the early stage (three leaves stage) have more impact on yield among the treatments.

SEEDS & PLANTING MATERIAL PRODUCTION

Table.1.1.2.2: Seeds and planting material production in 2017

Crop	Variety	Seed / material production
Spine gourd		1758 potted vines distributed
Tibbatu	Bindu	470 potted plants for farmers
Papaya	Rathna	5kg of breeder seeds produced

TECHNOLOGY TRANSFER

Field days and Trainings

- Crop clinics: Officers attended as resource persons and technical solutions were provided to farmer field problems.
- Provincial and Mahaweli Technical Group Meetings: Provided required technical assistance for preparatory meetings of Mahaweli and Eastern province for both the seasons.
- Technology transfer of spine gourd cultivation was done to extension officers.
- Conducted training programs for school children.

Services

- Soil testing: Analyzed 856 soil samples in farmer fields and research field and recommendations were given.
- Farmer advices were given for more than 50 farmers and visit 23 fields on field problems.

PLAN FOR 2018

- Varietal improvement of cluster onion considering high yield, short duration and reduce pest and disease problems
- Selection of best bolting lines for vegetables and true seeds production of Cluster onion
- Varietal improvement of Spine gourd
- Development of agronomic practices for yield improvement of Cluster onion, underutilized crops and rice.
- Development of suitable crop management practices for fruit crops such as Mango, Dragon fruit.
- Development of techniques to enhance the water productivity of other field crops.
- Development of soil management technologies for rice and other field crops.

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	12	03
Assistant Director of Agriculture (Development)	01	-
Administrative officer (Acting)	01	01
Agriculture Instructor (Special)	01	-
Research *Assistant (Special)	02	01
Agriculture Monitoring Officer	01	-

Designation	No. Approved	No. Existing
Development Officer	02	-
Agriculture Instructor	04	02
Research Assistant	09	03
Public Management Assistant	05	04
Technological Assistant (Extension)	06	05
Technological Assistant (Research)	04	01
Driver	05	04
Tractor Operator	02	01
Store Keeper	01	01
Carpenter	01	01
Mason	01	-
Electrician	01	-
Technician	01	01
Research Sub Assistant	04	03
Budder	01	01
Circuit Bungalow Keeper	01	-
Office Employee	01	01
Watcher	13	11
Laborer (Permanent)	96	78
Laborer (Contract)	-	25
Total	177	147

1.1.3 REGIONAL AGRICULTURE RESEARCH AND DEVELOPMENT CENTRE (RARDC) - KILINCHCHI

The mandate of the Regional Agriculture Research and Development Centre, Kilinochchi including its satellite stations located at Vavuniya, Thirunelvely and Mullaitivu is to conduct agricultural research

and development activities especially on other field crops which are economically important for the Northern region, to cater to the needs of farmers in that region.

BUDGET

Table 1.1.3.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	11,645,829	11,263,278	97
Capital	11,120,000	10,176,751	92
Projects			
• Hybrid			
○ Recurrent	2,190,000	1,625,102	74
○ Capital	1,100,000	743,359	68
• NARP	3,206,000	2,936,943	92
• FAO	462,000	165,721	36
Total	19,723,829	26,911,154	91

PROGRESS

RESEARCH

Crop Improvement

Onion

- Development of dual purpose onion was continued for the second consecutive year. Crosses were made among 30 germplasms already identified and 60 successful crosses were evaluated. Eleven lines which performed well were selected for PYT. Advanced breeding line of F₄ generation from 6 cross combinations

performed well and they were selected for PYT.

Tomato

- A selection from KC-1-1 for heat tolerance and high seed content was advanced. Promising heat tolerant lines selected from KC1 were further advanced.

Pumpkin

- Six promising lines were generated.

Foxtail Millet/ Groundnut/ Finger millets

- VAT for Groundnut, Finger millets and Foxtail millets were conducted.

Brinjal

- Eleven lines were selected for further evaluation. Promising Brinjal line was purified and advanced to the final stage of purification.

Chilli

- 17 progenies of 3 different crosses were advanced to F₃ level.
- 70 progenies of 6 different crosses were advanced to F₂ level and 8 improved lines were selected for PYT.
- 3rd self-pollination circle were completed for 38 lines and 5th pollination circle were completed for 30 lines for developing inbred lines.

Other Crops

- NCVTs were conducted for other field crops and regional mandated crops.
- Germplasm of varieties of Mango, Guava, Jack fruit, Moringa, Pomegranate, Grape and Banana were maintained.

Plant Entomology

- New chemical molecules to control the white grub in Groundnut were tested. Caseudophos performed well to manage the white grub.
- Palmyra leaf fencing for Chilli cultivation with maximum dimension of 10 m x 10 m was found to have positive effect on yield.

- Application of either Abamectin 2500 ml/ha at 2 weeks interval for 4 times or Fluopyram 1250 ml/ ha at 3 months interval was found to be effective in controlling nematodes in Chilli.

Plant Pathology

- Application of 15 t/ha of carbonized paddy husk before planting seed bulbs was found to be effective to control *Fusarium oxysporum* associated with bulb rot incidence of red onion.
- Application of 15 t/ha of Biocher before planting seed bulbs was found to be effective to control *Fusarium oxysporum* associated with bulb rot incidence of red onion.
- 16 isolations of deferent *Sclerotium rolfsii* pathogenic types and 6 isolations of *Fusarium oxysporum* pathogenic types were collected.
- Pathogenic fungi of new root and stem disease problems prevalent in grape cultivations in Northern region was identified as *Xylaria feejeensis*. Soil drenching of Mancozeb 64% +Metalaxyl 8% WP 20 g/10 l water was found to be effective to control the disease.

OTHER

- Following training programmes, field days and demonstrations on OFC and rice were conducted.
 - 4 field demonstrations on Maize, Black gram, Cowpea, Green gram and Groundnut
 - 5 field days
 - 2 In-service trainings for Agriculture Instructors
 - 24 seminars for school students

- 3 University student and 2 Diploma student completed the internships
- Technical inputs were provided for 12 Agricultural radio programmes broadcasted through National Service of the Sri Lanka Broadcasting Corporation, 'Rajarata Sevaya' and 'Rangiri' FM.
- Four newspaper articles were published.
- 248 plant samples were examined and technical advices were delivered to farmers. 53 clinical farmer field visits were conducted.
- 1,694 soil samples were tested and the reports were given to relevant programs/projects.
- Following projects were implemented.
 - Breeder seed production of selected crops
 - Production and release of parasitoid to control mealy bug in Papaya
 - Germplasm collection and establishment
 - Adaptive trials on Grapes and mushroom
 - Development of dual purpose cluster onion variety to fulfill the needs of planting materials and commercial bulbs requirements in Sri Lanka
 - Development of OPVs and hybrid of Maize, Onion and Chilli

AGRICULTURE RESEARCH STATION, THIRUNELVELY

ARS, Thirunelvely is one of the satellite stations of the Regional Agriculture Research and Development Centre, Kilinochchi.

PROGRESS

RESEARCH

- Germplasm of Apple Vellary collected earlier was evaluated.
- Antigonon liquid manure was tested on Chilli against Chilli Leaf Curl Complex. Observations studies are promising.
- Year round cultivation of Dioscorea was found to be possible in Jaffna using local landraces.
- NCVTs were conducted for other field crops and regional mandated crops such as, vegetables, fruits crop and rice.
- Breeder seed bulb multiplication of Red Onion TV Red was carried out and buffer stock was maintained.
- Studies proved that *Cyperus rotandus* can successfully be controlled by cultivating Sunhemp and Cassava.
- Cultivation practices for new Okra line was identified.
- Management package for the Brinjal Little leaf disorder was identified.
- A new cropping system involving Mae and Maize was tested

OTHER

- Cultivation of Red Onion under organic condition was completed.
- Soil samples were collected from problematic soil and gave the solutions.
- 707 soil samples were tested under routine soil testing, GS division based soil recommendation and Northern Province PSDG programs.
- Drip irrigated Chilli MI CH HY 1 was cultivated. Planting 5-10 cm away from

drip lateral gave highest Green Chilli yield in Calcic Red Yellow Latasol soils in Jaffna.

- A Sprinkler irrigation suited to the local condition was identified and testing is under progress.
- Officers were involved in carrying out the activities of FAO supported Development of site specific fertilizer management system for sustainable crop production project and Fertilizer Sub Committee of the Department of Agriculture.
- Soil investigation of the proposed Agricultural Area at Naval, Jaffna of the JKWSSP was successfully completed.
- Farmer's and Extension staff's problems on crop, soil and farming activities were solved through our advisory services.
- Number of training programs, exhibitions, field days and demonstrations on OFC and Vegetables for farmers, university and School students were conducted.

STAFF LIST

RARDC, Kilinochchi

Designation	No. Existing
Additional Director	01
Assistant Director of Agriculture (Research)	03
Development Officer	02
Research Assistant	02
Technical Officer	01
Public Management Assistant	01
Technological Assistant	04
Driver	02

Designation	No. Existing
Tractor Operator	01
Mechanic	02
Mason	01
Technician	01
Watcher	06
Laborer (Permanent)	52
Laborer (Contract)	32
Total	111

ARS, Thirunelvely

Designation	No. Existing
Assistant Director of Agriculture (Research) In Charge	01
Assistant Director of Agriculture (Research)	02
Development Officer	03
Agriculture Instructor	02
Research Assistant	04
Public Management Assistant	01
Technological Assistant	01
Driver	01
Storeman	01
Research Sub Assistant	01
Watcher	03
Laborer (Permanent)	19
Laborer (Contract)	19
Total	58

1.2 HORTICULTURAL CROPS RESEARCH AND DEVELOPMENT INSTITUTE (HORDI) – GANNORUWA

Horticultural Crops Research and Development Institute (HORDI) located at Gannoruwa is the main research institute of the Department of Agriculture responsible for the Research and Development activities of Olericulture. Thus its mandated crop groups are vegetables, root and tuber crops including Potato. Regional research centers located at Bandarawela, Makandura and four other research centers located at Seetha Eliya,

Giradurukotte, Thelijjawila and Rahangala come under the purview of the HORDI. In the research program, the institute mainly focuses on the development of adaptable vegetable varieties and appropriate crop management practices to ensure the productivity while safe guarding the environment. In addition to engage in research the institute involves in agriculture development activities which are directly connected with its research mandate.

BUDGET

Table 1.2.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	35,443,931	23,487,183	66
Capital	28,056,919	28,733,079	102
Projects			
• KOPIA – Mushroom (285-2-2-4-2502 (13 Mush-28)	3,067,000	3,840,000	125
• Integrated Management system for plant genetic resources	3,500,000	2,970,000	85
• Production of postharvest manuals and application of manuals (285-2-2-42502(13) AFACI-10	2,232,000	2,050,000	92
• NARP (285-2-2-5-2502-11)	9,167,400	9,073,113	99
• Asian network for sustainable organic farming technology (285-2-2-4-2507(13)33	1,762,000	1,663,000	94
• Technology dissemination of virus free seed potato production using hydroponic production systems (285-2-2-4-2507-(13)IMPGR 13)	2,212,000	2,700,000	122
• New hybrid and open pollinated variety development and basic seed production (285-2-2-8-2507)	27,000,000	27,137,900	101
• Postharvest management and market promotion (285-2-2-12-2502-13)	63,000,000	57,000,000	90

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Technological interventions to improve production and productivity of selected vegetables (118-2-3-2502-R2)	1,000,000	650,000	65
• Development of bio intensive integrated pest and disease management (BIPM) (118-2-3-20-2509-R3)	3,000,000	2,906,000	97
• Soil test based fertilizer recommendation for GS divisions and efficient fertilizer management (118-2-3-20-2509-F8)	100,000,000	98,571,000	99
• Sweet potato and cassava cultivation to overcome food shortage in the country due to prevailing drought (118-2-3-20-2509-S2)	2,580,000	2,183,000	85
Total	282,021,250	262,964,275	93

PROGRESS

CROP IMPROVEMENT

Brinjal

Three Brinjal hybrids selected from previous trials were tested for their adaptability under research and farmer conditions in diverse agro ecological regions. Another 3 high yielding 'lenairi' type hybrids were tested in advanced major yield trials. New hybrid combinations comprise of 19 purple and 5 'lenairi' types were made from parental lines selected from previous studies. Two high yielding open pollinated lines SBN (EG 11) and EGFR (EG 12) were advanced to NCVT.

Three imported varieties were evaluated however none of the imported varieties were recommended for 2nd season evaluation due to their susceptibility to bacterial wilt disease.

Tomato

All 05 Tomato hybrids evaluated at AMYT were selected for NCVT. Six open pollinated

varieties were advanced to MYT. 15 new interspecific cross combinations were made by crossing selected inbred lines with a close wild relative to produce genetically diverse parental lines.

20 exotic Tomato hybrids were evaluated and one hybrid variety was recommended for large scale demonstration in farmer fields.

Capsicum

Morphological characterization of 20 germplasm was completed. One accession was selected for further studies based on high yield (1kg/plant), early flowering, light green shiny pods and field resistance to bacterial wilt. Ten accessions were identified for the development of inbred lines. Among them, 05 accessions showed tolerance to water deficit conditions while others showed heat tolerant characteristics. A study was conducted to assess the heat tolerance in four new accessions using pollen viability and pollen germination at reproductive stage. All four accessions were classified as heat sensitive

while the recommended variety, CA8 was identified as intermediate heat tolerant based on Cumulative Response Index (CRI).

Intra and inter-specific crosses were carried out to create genetic variation. Among thirty crosses in wide hybridization, five crosses of *C. annuum* x *C. chinense* and one cross of *C. annuum* x *C. frutescens* were succeeded.

Among three exotic varieties evaluated for yield and pest and disease resistance, one variety was recommended for large scale demonstration.

Bean

Two locally developed lines selected based on yield and quality characteristics from previous studies were advanced to major yield trial. Thirteen F₁s were advanced to F₂ generation. Five germplasm were selected as parental lines.

Mutation breeding was initiated to develop high yielding quality bean varieties with virus tolerance. Irradiated seeds of two varieties were screened and advanced to M₂ generation.

Yard long bean

Adaptability studies of two locally developed lines were continued at diverse environments. Two high yielding color rot resistant lines tested at NCVT were nominated for adaptability studies. From the MYT tested 12 lines, 4 were selected for AMYT. 15 new crosses were made from the selected parental lines.

Luffa

Five lines were advanced to MYT based on yield and fruit characteristics. From the OYT,

six lines having desirable characteristics were selected for PYT.

Developments of 14 inbred lines were continued to produce F₁ hybrids. Generation advancement of five F₃ and two F₂ populations was carried out to develop inbred lines. 54 new cross combinations were made.

Okra

A program was initiated to develop high yielding quality Okra varieties (F₁ hybrids and OPVs) to meet the market demand. Out of 54 germplasm tested, 8 were identified based on yield and pod characteristics. Sixteen new cross combinations were made. Fifty four F₁s were advanced to F₂ generation.

Cucumber

Four populations comprise green and white fruits were advanced to F₃ generation. All six tested exotic cucumber varieties were selected for second seasonal evaluation.

Bitter gourd

Two lines were selected for OYT. Six populations were advanced to F₆ generation while eight populations consist of both white and green pods were advanced to F₃ generation. Out of ten exotic varieties tested for yield, fruit characters and pest and disease susceptibility, three varieties were accepted for large scale demonstration.

Pumpkin

New pumpkin variety (*Cucurbita moschata*), 'Padma' was officially released.

Cassava

A total of 4 accessions were nominated to NCVT to select high yielding short age Cassava varieties with tolerant to virus disease.

Dioscorea

Out of 45 Dioscorea accessions evaluated, 7 accessions were selected based on yield and other agronomic traits and distributed among farmers for cultivation.

TISSUE CULTURE

Anther culture technology for Capsicum varietal development

Development of anther culture technology was carried out using 3 different cultivated varieties of Capsicum (CA8, LYW, HYW) and two different Bell pepper hybrids (Indra F₁, King Arthur F₁). Best callus induction medium for both capsicum and bell pepper was MS medium with 1 mg/l NAA and 2 BAP. Research activities are going on to develop callus regeneration medium.

***In vitro* tuber production technology for Dioscorea**

In vitro micro tuber production technology was developed for Dioscorea varieties, Raja ala, Kiri kodol and Kekulu. Best mini tuber production medium was MS medium with 2 mg/l BAP and 0.5 mg/l GA3. Suitability of micro tubers for field establishment will be studied.

Marker identification and development for bean rust resistance

Two SCAR markers were selected to identify UR 3 gene in Aurora and related crosses.

AGRONOMY

Optimum spacing for newly released Capsicum variety, Prarthana

The objective of this study was to identify the optimum spacing for newly released Capsicum variety Prarthana. Six spacing were tested to verify the results of previous studies and confirmed that 40 x 30 cm² was the optimum spacing for the variety.

Plant pruning for Salad Cucumber grown in protected houses

This study was conducted to confirm the effect of plant pruning of salad Cucumber grown in protected houses on crop yield. Results revealed that alternative pruning of single branches increase the crop yield of salad cucumber by 25%.

Plant pruning of Tomato grown in protected houses

The experiment conducted to verify the best pruning methods for tomato grown under protected houses revealed that alternative pruning of single branches in Tomato increased the crop yield by 15% and improve the seed quality.

Canopy management, fruit thinning, plant density and nutrient management on seed yield and seed quality of Brinjal

Availability of quality seed is necessary to increase the crop productivity. This experiment was conducted to identify the best treatment combination to improve the seed yield and quality in Brinjal. Maintaining 3 shoots and 7 fruits at 60 x 60cm² spacing with 1½ DOA

fertilizer recommendation is identified as the best combination to increase seed yield by 20% and improve seed germination in Brinjal variety SM164.

Plant training and spacing for Cucumber - Kalpitiya white

Kalpitiya white is the female parent of hybrid Cucumber variety HORDI Green. The objective of this study was to study the optimum spacing and the training technique to improve the seed yield in Cucumber, variety Kalpitiya white. DOA recommended spacing along with pruning of two lowest lateral branches increase the seed yield by 18%.

Sweet Potato

Six sweet potato varieties and 3 fertilizer combinations were evaluated for polysack cultivation of sweet potato at home gardening. Gannoruwa white and farmer field selection 1 showed significantly higher yields of 1.45 and 1.375 kg respectively.

Lablab Bean

Six different *Lablab purpureus* cultivars were studied for growth habit and phenology. Accession 12141, 12142 and 12146 showed high sensitivity to photo period, and hence flowering and pod production were observed only from October, 2017. The experiment is in progress.

Year round availability of good quality planting materials of Cassava

An experiment was continued to study the effect of improved agronomic package (hormone treated 1 m length stem cuttings

planted in bigger holes) on planting material production of Cassava. Results revealed that this technology increased the total stem cutting production by developing more number of branches per plant. During 2016, a total of 130,000 cuttings/ha was obtained however, it was decreased to 67,000 cuttings (52%) in 2017 possibly owing to severe drought conditions.

Productivity increase in Cassava

A study was initiated to test the effect Indol3-Butyric Acid (growth regulator) on tuber productivity of Cassava. Different levels of Indol 3- Butyric Acid were applied to stem cuttings at the time of planting. Study is continued.

Dioscorea (Wel ala)

Development of farmer friendly technology for rapid multiplication of Dioscorea crop is underway.

FLORICULTURE

Studies were initiated last year to identify LD50 value for six selected ornamental crops using different doses of Co60 gamma irradiation. The LD50 dose was identified as 125 rads for *Zamiocuculus zamifolia*, 365 rads for *Anthurium andreanum* seeds, 400 rads for *Munronia pinnata*. All the irradiated materials showed over more than 50% death and significantly slow growth rates.

In the evaluation of a mutant of philodendron (*lemon lime*), variations were observed among vegetatively multiplied plants. Experiment is in progress.

Munronia pinnata is a single stem plant. Bushy attractive flowering pot plants of *M.*

pinnata were obtained through thumbnail pruning followed by 2 consecutive applications of 200 ppm Gibberellic acid in 1 month intervals.

SOIL FERTILITY AND PLANT NUTRITION

New fertilizer recommendations for hybrid Capsicum

Studies were continued to develop new fertilizer recommendations for hybrid Capsicum. Different rates of nitrogen and potassium fertilizers were applied based on nutrient removal data. There was no response to the application of N fertilizer beyond 120 kg/ha for the hybrid Ramya. However, application of 160 kg/ha N fertilizer gave highest yields of 21.5 t/ha for Prarthana. There was no response observed on application of K fertilizer on both varieties at soil test values of 247 ppm. This study will be continued.

Validation of New Fertilizer Recommendation for Hybrid Luffa

Newly developed fertilizer recommendation of 150 kg/ha N and 75 kg/ha of K for Luffa hybrid varieties was tested at HORDI and in farmer fields at Marassana, Matale, Palugaswewa and Thelijawila. Farmer practices were adopted in the research field as well. Highest yield was obtained with the fertilizer recommendation at both research and farmer fields.

Nutrient Management Package for quality Seed Production of Tomato

A study was conducted to develop suitable nutrient management package for quality seed

production of Tomato. Different rates and splits (3 and 6 splits) of N and K fertilizers were tested with and without secondary and micronutrients. Results revealed that application of excess N, K fertilizers, secondary and micronutrients had no significant effect on yield and quality of fruits and seeds.

Site Specific Fertilizer Management System for Sustainable Vegetable Production

A study was conducted to develop site specific fertilizer management system for vegetable production. Five treatments consist of no nitrogen, phosphorous and potassium, soil test based fertilizer recommendation and NPK blanket recommendations were tested for Beans, Tomato and Bitter gourd. Results showed that there was no significant yield difference between treatments of no application of P and K, soil test based fertilizer recommendation and blanket NPK fertilizer recommendation irrespective to crops. However, no nitrogen treatment gave the lowest yield. Soil test values showed that the experimental sites have high P and medium content of potassium.

Bioavailability of Cadmium in soil from TSP fertilizers

A study was conducted to determine the bio availability of Cd in soil and plants due to the application of Triple Super Phosphate. Experiments were conducted on Knol khol and Cabbage under field conditions. Though crop yield was not increased with the application of excess TSP fertilizers, Cd contents in both

plant tissues and soil were increased with the excess usage of TSP.

ORGANIC FARMING

Nutrient Management

Split application of different organic nutrient sources of compost and poultry manure with compost tea on growth and yield of Okra, Radish and Beans were tested. Crop yield of Okra, Radish and Bean can be maintained by basal application of compost combined with split application of poultry manure. Except Okra and Radish, split application of compost tea had no effect on bean yield. Hence, this study proved that by practicing basal and split application of organic manures sustain the crop productivity in organic farming.

Application of Partially Burnt Rice Husk

The effect of application of Partially Burnt Rice Husk (PBRH) with compost and poultry manure under mix cropping of Cabbage, Luffa and Capsicum were tested. Highest total mix yield (36.6 t/ha) was obtained with DOA recommended fertilizer treatment followed by the application of NPK alone (34.6 t/ha). Application of poultry manure with 250g of partially burnt rice husk treatment yielded 31.3 t/ha.

Long term application of compost

At the end of 34th seasons in a long-term study under vegetable cultivation, application of only NPK produced the highest yield of Brinjal (24.1 t/ha) followed by 40 t/ha of compost (21.2 t/ha). In Snake gourd, combined use of 40 t/ha compost and recommended NPK fertilizers gave the highest yield (23.3 t/ha)

while 17.3 t/ha yield was obtained from 10 t/ha compost with recommended NPK fertilizers in the 35th season.

Screening of different varieties of vegetables

A study was conducted to identify suitable vegetable crops/ varieties for organic farming. Five varieties of vegetable Cowpea and two varieties of Tomato were tested under low input condition. Vegetable Cowpea varieties BS 1 and Gannoruwa Hawari and Tomato variety T 245 performed well under organic farming conditions.

Influence of tillage on soil physical properties

A study was conducted to assess effects of minimum tillage on soil physical properties on Reddish Brown latosolic soils. No appreciable variations between the two tillage practices were observed in soil properties. There was no significant yield difference observed in Snake gourd among two tillage practices. However higher vine height and root length were observed under tillage treatment. Experiment will be continued.

Use of broiler litter bio-char to improve soil fertility and crop yield

Experiment was initiated to assess effects of applying broiler litter bio-char at different depth of soil. Broiler litter bio-char mixed with soil @ 5 t/ha at 15cm depth was produced the highest yield of carrot (19 t/ha) compared to 5cm (14.9 t/ha), 30 cm (11.7 t/ha) and control (11.3 t/ha).

Nitrogen supplementing ability of selected nitrogen fixing inoculums with Capsicum

Selected nitrogen fixing inoculum was tested with different rates of chemical nitrogen in the field. The capsicum variety CA 8 used in this study. Nitrogen fixing bio inoculum was applied with 25%, 50%, 75% and 100% recommended urea in addition to urea alone. The highest yield was reported in the treatment of 50% chemical nitrogen with bio inoculum in the observational study.

Assessment of preferred form of Nitrogen

Five nitrogen (N) treatments were provided to five vegetable crops as 0:100, 25:75, 50:50, 75:25 and 100:0 of ammonium to nitrate ($\text{NH}_4^+/\text{NO}_3^-$) ratio in liquid fertilizer medium. Preference of 25:75 of $\text{NH}_4^+/\text{NO}_3^-$ ratio was observed in lettuce for dry matter accumulation, N, P and K nutrition. Capsicum is responded well with 75:25, $\text{NH}_4^+/\text{NO}_3^-$ ratio in dry matter accumulation and N nutrition. Equal amount of $\text{NH}_4^+/\text{NO}_3^-$ ratio was preferred by Cabbage for dry matter accumulation. The results of the study imply that different vegetable crops prefer different N forms presence in the growth media.

ENTOMOLOGY

Insecticides for leafy vegetables

Insecticides have not been recommended for leafy vegetables due to short harvesting periods and fresh consumption habits. However, immediate requirement has been emerged on recommendations due to detection of pests in export commodities and haphazard

pesticide usage leaving residues on commodities. Therefore, several insecticide screening studies were conducted against major pests, with three potential insecticides. Sulfoxaflor 50% WG has been recommended against leaf hoppers and white flies in leafy vegetables. The study is in progress to identify low toxic alternative insecticides.

Insecticides for virus vector management

Control of virus vector insect species is vital to avoid wide spread of virus diseases. Use of insecticides is one of the major techniques used in combination with other integrated practices. Virus vectors are usually cryptic species that will develop resistance against commonly used insecticides. Therefore, availability of insecticides with different modes of action for alternative applications slow down resistance build up in insects. Several insecticides with new modes of action have been tested against whiteflies, aphids, leaf hoppers and thrips in Cucurbits and Tomatoes. Study is in progress.

Pollination services in different ecosystems - A Baseline assessment

Pollinators associated with crops in three districts namely Kalutara, Kandy and Kurunegala was assessed at three localities namely Bandaragama, Ududumbara and Galgamuwa. Three honey bee species (*Apis cerana*, *A. dosata*, *Trigona iridipennis*) and nine pollen species (*Xylocopa tenuiscapa*, *Amegilla scinti*, *Ceratina binghami*, *Lithurgus atratus*, *Haplonomia westwoodi*, *Megachile umbripennis*, *Haplonomia westwoodi*, *Braunsapsis sp.*, *Amegilla puttalama*, *Ceratina*

hieroglyphica) were identified. Three species are yet to be identified (*Amegilla* sp., *Megachile* sp., *Lassioglossum* sp.). Three wasps were also identified (*Scolia* sp., *Megacampsomeris ceylonica*, *Colcacampsomeris* sp.). Some of the identified species were native to each locality. Therefore, it is necessary to develop strategies to conserve their populations to enhance pollination in crops.

Introduction of New Nematicide

Abamectin 20 g/l SC was identified and recommended for management of Root Knot Nematode in Leafy Vegetables namely Gotukola and Mukunuwenna and for Tomato. This nematicide was included as a component of integrated nematode management package for GAP demonstrations on Gotukola.

Efficient field release technique of papaya mealy bug parasitoid

Use of a parasitoid has been identified as a biological way of managing mealy bug in papaya. Efficient field release method was developed for the management of papaya mealy bug (PMB), *Paracoccus marginatus*. A puparium card was developed for the field release of the parasitoids. Using this method, 5,000 parasitoids per ha can be released in two weeks interval.

Mass rearing of Wax scale insects *Ceroplastes* sp. and their parasitoids

Studies were initiated on identification and rearing of parasitoids of scale insects. It was found that *Aglaonema* was the best host plant for mass rearing of wax scales.

Diversity and abundance of Fruit flies in Cucurbits

Five species of fruit fly, *B. cucurbitae*, (melon fruit fly) *B. tau*, and *Dacus ciliatus*, *B. diversa* and one unidentified species were recorded in infested Cucurbits (Pumpkin, Cucumber, Snake gourd, Luffa and Bitter gourd) from Anuradhapura, Kurunegala and Kandy districts. *B. cucurbitae* was the predominant species (>86%). Even though five different species infest cucurbits fruits, current recommended IPM package can be implemented to suppress above pest population except *D. ciliatus* which is not attracted to Methyl Eugenol or Cue-Lure pheromone traps.

It was revealed from the survey conducted in Anuradhapura, Kurunegala and Kandy districts that most of the farmers were aware of Methyl Eugenol pheromone traps than Cue-Lure traps. The melon Fruit Fly (*B. cucurbitae*) counts in Cue-Lure traps were significantly higher than those collected in Methyl Eugenol traps. Therefore, farmer awareness about pheromone traps is considered as important in cucurbit infesting fruit fly control programs.

Farmers' perception on Management of Fruit flies

Farmer survey revealed that farmers followed three different methods for the control of fruit fly: area wide IPM program (AWIPM), regular application of insecticides, and other mix approaches. Farmers who rely on insecticides have applied Acephate 75% SC, Profenofos 500 g /l EC, Abamectin 18g/l EC and Acetamiprid 20% SP regularly at 5 – 7 day intervals which are not recommended against fruit flies.

Six reasons identified for non-adoption of AWIPM program were unawareness, unavailability of continuous supply of protein bait, trustworthiness of AWIPM package, fast action of insecticides/ willingness to rely on insecticides, different time of planting of Cucurbits in Yaya/ none cooperation among farmers, and higher infestation of fruit fly. Therefore, conducting awareness programs on AWIPM is important.

New control techniques for AW-IPM program on Fruit flies

Male attractive sex pheromone traps are used for monitoring purpose in this study. Mass trapping using 15 traps in an area of 1 km radius from HORDI and 5 other monitoring traps in a boundary line of 7 km radius from HORDI were established for four months. More than 150,000 fruit flies were caught and identified. During the study period *Bactrocera correcta* was the predominant species contributing to 71% of the population followed by *B. kandiensis* (19%) and *B. dorsalis* (10%). A significant reduction of populations of *B. correcta* (2718/day to 333/day), *B. kandiensis* (478/day to 261/day), *B. dorsalis* (324/day to 111/day) was observed at the end of the study.

Azadiractin formulations against Melon fruit fly in Cucurbits

Azadiractin formulations (Azadiractin 50 g/l, Azadiractin 10 g/l, Azadiractin 80% (micro), Azadiractin 0.03% + Karanjin 4%), reported as oviposition deterrent and repellence of *Bactrocera cucurbitae* through Laboratory bioassay, were applied as foliar spray in the field in 2016 at 7 days interval. But result showed that none of the formulation was

effective to suppress the melon fruit flies in Cucurbits. In 2017 Yala, these formulations were tested in the field with 5 days interval. Azadiractin 80% (micro) 17 ml/l showed significant reduction in damaged fruits compared to the control but unmarketable yield was nearly 40%. Therefore application of above Neem formulations available in the market at 5 days interval will not be an effective management tool melon fruit fly in Cucurbits.

Improvement to IPM package for the control of Bean yellowing

Live (Maize border) or physical barrier, Cruiser seed treatment (3.5 g)/1 kg of seed + Sticky trap + Alternative application of Phymetrozine 50% WG and Apploud (Buprofezin 10%WP) at 7-10 D interval till flowering showed promising results in controlling Bean yellowing.

PLANT PATHOLOGY

Management of *Fusarium* wilt of Solanaceous crops by Endophytic bacteria

A total of eighty isolates of *Fusarium* recovered from 100 *Fusarium* wilt samples collected from Kandy, Matale, Nuwara Eliya and Bandarawela areas during January- June, 2017 were tested for their pathogenicity using the soil infestation technique. Twenty five out of eighty *Fusarium* isolates were identified as pathogenic. Forty healthy Tomato and Brinjal plants were collected from *Fusarium* wilt infected fields and thirty endophytic bacterial isolates were recovered and screened for their in vitro antagonistic activity toward *Fusarium*. Six out of 30 endophytes were found to be

virulent on *Fusarium oxysporum* and *Fusarium solani* species under in-vitro conditions. Six endophytic bacteria were identified and out of which four were *Streptomonas* spp and two were *Bacillus* spp. Studies are in progress to develop a suitable bio-formulation.

Diversity of *Ralstonia solanacearum* species complex

114 samples collected from major Solanaceous crops growing areas showed typical bacterial wilt symptoms. Bacterial isolates were confirmed. Direct PCR method was developed to identify *Ralstonia solanacearum* which is very quick and economical.

Biovar determination was done with biochemical testing and according to the results all isolates belongs to Biovar III. Race identification with pathogenicity with four crops, Tomato, Brinjal, Capsicum/ Chilli and potato revealed that Matale and Kandy isolates belong to race 1 and 3.

Management of *Botrytis* blight of Lettuce

Studies were conducted to identify the effective IPM package to control the *Botrytis* blight of Lettuce. *Botrytis* spp. was isolated, pure cultures were prepared and their pathogenicity was confirmed by Koch's postulation. Bio-efficacy testing was conducted using *Trichoderma asperellum*, *fluorescens*, *Pseudomonas* spp and fungicide (Dicloran 75WP) against artificial inoculation of *Botrytis* spp. under *in vitro* and in a protected house with Ice burg variety Eden. Results revealed that *Botrytis* blight of lettuce can be effectively controlled by spraying liquid

formulation of *Trichoderma asperellum* (10 ml/l) in 7 days interval.

Identification of compatible insecticides with *Trichoderma asperellum*

In vitro studies were conducted to identify the compatibility of *T. asperellum* with different synthetic insecticides (Imidacloprid 70% WG, Thiocylam hydrogen 4% GR, Chlorantraniliprole 20%+Thiomethoxam 20%, Abamectin 18g/I EC, Thiamethoxam 25% WG, Buprofezin 10% WP, Fipronil 50 g/I SC, Profenofos 500 g/EC, Sulfoxaflor 240SC and Spinetoram 120SC). Results revealed that Imidacloprid 70% WG, Chlorantraniliprole 20%+Thiomethoxam 20%, Thiamethoxam 25% WG, Buprofezin 10% WP, Sulfoxaflor 240SC and Spinetoram 120SC are compatible with *T. Asperellum*.

Effective bio control agent to control soil borne pathogens

The isolated indigenous strain of *P. fluorescens* had potential to be used as a bio-control agent for the management of *Fusarium*, *Sclerotium*, and *Phythium* fungal pathogens. *P. fluorescens* could inhibit the growth of *Fusarium*, *Sclerotium* and *Phythium* in *in vitro* condition. Molasses is a good medium for maintaining *P. fluorescens* as a viable inoculum. It gave 2.5×10^9 cfu/ml after three month of preparation.

Health testing of imported seed potato

Seed potato samples of eighty consignments imported from different countries were tested for quarantine diseases. *Erwinia carotovora*,

Geotrichum candidum, *Fusarium* spp., *Rhizoctonia solani*, *Helminthosporium* spp. and *Streptomyces* spp. were commonly found in consignments but below the limits of the Dutch scale. One sample was rejected due to higher number of netted scab (*Streptomyces reticulisscabies*) contaminated tubers while two other samples were rejected due to powdery scab (*Spongospora subterranea*).

Screening of exotic hybrid for seed borne viruses

Twenty two Bitter guards, seven Cucumbers, two Gherkins and one Butter nut hybrid seed sample imported from various countries were

screened for seed borne virus. Results revealed that two seed samples of Bitter gourd and one Cucumber sample were positive for CGMMV. All the other seed samples were free from seed borne virus.

Screening of exotic hybrids for resistance to Bacteria wilt

Imported hybrid vegetable varieties were screened for resistance to bacteria wilt caused by *Ralstonia solanacearum* under greenhouse conditions. Varieties showing moderate resistance to bacterial wilt disease were nominated for adaptability testing.

Table 1.2.2: Susceptibility of varieties evaluated for bacterial wilt

Crop	No. of varieties evaluated	Resistant (<10%)	Moderately resistant (10-20%)	Moderately susceptible (21-40%)	Susceptible
Tomato	18	-	07	03	08
Brinjal	06	-	02	01	-
Capsicum	01	-	01	-	03
Bell pepper	03	-	02	-	01

Detection of Phytoplasma in imported seeds of Bitter gourd

Seed lots screened with nested PCR technique using phytoplasma specific primers and it amplified a fragment of 1250 pb confirmed the presence of phytoplasma in two seed lots of bitter gourd hybrid variety Maya.

Bio-efficacy of new fungicides

One New formulation of Mancozeb 75%WGD at 20 g/10 l and new fungicide Mandipropamid 5%+ Mancozeb 60% at 25 g/10 l can effectively be used to control downy mildew of Cucurbits.

DEVELOPMENT

Awareness and Technology transfer programs

Basic training and basic awareness programs on different subjects of agriculture were conducted for more than 5,000 participant from various organization representing schools, government secretariats, Mahaweli Authority, Open prison camp, Center for Army Vocational Training, Sri Lanka Bureau of Foreign Employment and different societies.

Industrial Training Programs

Table 1.2.3: Details of Industrial Training Programs conducted

Degree Sought	Number of Student	University	Training Period
Bsc Agriculture NVQ Level - 7	23	Open University University of Sabaragamuwa University of Wayamba University of Rajarata	15 weeks
NVQ Level - 6	28	School of Agriculture, Kundasale School of Agriculture, Angunakalapelessa Advance Technology Institute, Ampara Advance Technology Institute, Naiwala Advance Technology Institute, Labuduwa	6 month
NVQ Level - 5	7	Sri Lanka School of Agriculture, Bibila	6 month
NVQ Level - 4	13	Technical College, Embilipitiya National Youth Services Council	6 month
Total	71		

Exhibitions

Table 1.2.4: Details of exhibition conducted

Details of Program/ Station	Date	Target Group
Ke/Wa- Niyandurupola Maha Vidyalaya	25 January 2017	All category
Kegalle Vidyalaya	13,14,15 January 2017	All category
Diyathilaka Central College, Hanguranketha	21,22,23 February 2017	All category
St. Anthony's College, Kandy	25,26,27 May 2017	All category
Pushpadana Girls College, Kandy	1,2,3 June 2017	All category
Kingswood College, Science Society	25, 26	All category
Provincial Agricultural Exhibition – 2017, Jaffna	19,20,21,22,23 September 2017	All category
Center of Excellence for Organic Agriculture, Makandura	14,15,16 December 2017	All category
Total	8	

Services

Table 1.2.5: Details of the services provided

Service	Number	Remarks
Leaflets distributed	6,560	172 varieties of leaflets are available
Advisory services	42	Written answer
	312	Technical advice by telephone
	357	Verbal advice for visitors
Diagnosis	357	Disease samples including vegetables, tubers, ornamentals, fruit crops, other field crops and rice. Insect damage and fungal damage in mushroom compost bags
Training on Vegetable breeding/ Newly released varieties	11 programs	Agriculture Extension personnel
Training on hybrid seed production	05 programs	SPMDC and Students from Schools of Agriculture - Angunakolapelessa, Karapincha, Kundasale, Pelwehera
Training on soil testing		
Training on home garden	566	Farmers
Cultivation of Sweet potato in home gardens	55 trainings	Farmers, Officers of Government and non-government organizations
Training on protected agriculture	85	Farmers
Spawn production	3,487 bags	Oyster mushroom
	225 mother spawn	Paddy mushroom
Certificate issued for mushroom training	340	For their business registrations
Training on oyster mushroom, paddy mushroom and spawn production	1,507 individuals and 30 programs	Farmers , Extension officers, Students
Training on participatory guaranty system for organic agriculture	1,600 individuals and 28 programs	Agriculture extension officers
Training on different subject on agriculture	3,200 individuals and 72 programs	Participant from various organization - school. Farmer organization, university, different society

Service	Number	Remarks
District Technical agricultural committee meeting	04	Kegalle
Provincial Technical agricultural working groups	10	
Machinery introduce	02	Two bag filling machines for mushroom cultivation were identified and recommended for mushroom cultivation
TV programs	03	Different topics
Radio program	27	Different topics

Breeder seed production

Table 1.2.6: Quantities of breeder seeds produced

Crop	Variety	Quantity
Yard long bean	Gannoruwa A9	26.85
	Gannoruwa Hawari	7.0
Bean	Gannoruwa Green	6.5
Bitter gourd	Matale Green	1 kg
Cucumber	Kalpitiya white	0.75 kg
Tomato	Lanka sour	0.45 kg
Brinjal	HS2 - Parent line	1.83 kg
	5124 - Parent line	1.5 kg
	Padagoda	1.3 kg
Traditional varieties	Okra (Ethdala)	3.1 kg
	Okra (Red)	300 g
	Tomato (Goraka)	300 g
	Kekiri	350 g
	Spinach	300 g

Planting material distribution

Table 1.2.7: Quantities of planting material distributed

Crop	No. of cuttings
Sweet potato	342,000
Cassava	54343
Other root crops	854

Laboratory Analytical Services

During the year 2017, 880 soil, 155 compost, 152 water and 40 plant samples were analyzed and reports were submitted. Plant and soil samples received from farmers with various problems were analyzed for secondary and micronutrients. In addition 2115 soil samples collected from GS divisions were analyzed for the recommendation of soil test based fertilizers for paddy. The revenue collected from soil and

compost analysis during the year 2017 was Rs. 344,325.00.

Special Fertilizer testing program

Thirteen fertilizer products were tested in green house and field conditions and four products were recommended for importation. The revenue collected from fertilizer testing program was Rs. 6,320,000.00.

Soil testing at Grama Niladhari divisions

Under this program soil samples were collected covering all the Grama Niladhari division by the Agricultural Extension division. Samples were analyzed and recommendations are being formulated. Twenty soil testing laboratories purchased under this project was established in 20 districts of the country to expand the soil testing service.

PLAN FOR 2018

- Development of hybrid and open pollinated vegetable crop varieties adaptable to local farming conditions
- Development of climate resilient hybrid and open pollinated vegetable crop varieties
- Development of appropriate technology package suited for different environmental conditions
- Development and identification of environmentally friendly, safe input management options for vegetable growers
- Domestication and popularization of traditional and wide vegetable crop species
- Development and popularization of mushroom production technology.
- Production of nuclear seed materials

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	-
Principle Scientist	05	03
Additional Director of Agriculture	02	-
Deputy Director (Research)	08	05
Assistant Director of Agriculture (Agricultural Research)	87	40
Assistant Director of Agriculture (Agricultural Economics)	03	-
Assistant Director of Agriculture (Agricultural Development)	-	03
Administrative Officer	04	03
Agriculture Instructor (Special)	11	-
Research Assistant (Special)	07	04
Economist Assistant	03	02
Information & Technology Officer	01	01
Agricultural Monitoring Officer	02	02
Program Assistant (Agriculture)	31	20
Development Officer	24	14

Designation	No. Approved	No. Existing
Agriculture Instructor	50	49
Research Assistant	84	57
Engineering Assistant	02	01
Public Management Assistant	43	41
Technological Assistant (Engineering)	03	-
Technological Assistant (Extension)	28	30
Technological Assistant (Research)	03	02
Farm Clerk	08	10
Driver	28	25
Tractor Operator	12	10
Storeman	07	07
Mechanic	05	03
Machinist	03	02
Technician	10	08
Carpenter	05	02
Mason	04	01
Electrician	05	02
Research sub Assistant	24	18
Water Pump Operator	-	01
Bee Keeper	-	01
Budder	07	07
Circuit Bungalow Keeper	05	04
Lorry Cleaner	01	01
Office Employee	06	06
Watcher	69	61
Laborer	476	398
Sanitary Laborer	02	02
Contract Laborer	109	77
Total	1188	923

1.2.1 FOOD RESEARCH UNIT (FRU) – GANNORUWA

The Food Research Unit (FRU) comes under the purview of Horticultural Crop Research and Development Institute (HORDI) of the Department of Agriculture. FRU is primarily responsible for conducting the research on post harvest technology & product development of food crops. Quality evaluation of samples derived from crop improvement program is

another responsibility of the unit. FRU performs collaborative programs with non government and private sector organizations on technology development, transfer and use of machineries. In addition, the unit provides necessary facilities and guidance for undergraduate and post-graduate students to conduct their research on diverse aspects of postharvest and processing technologies.

BUDGET

Table: 1.2.1.1: Annual budget- 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,830,624	1,830,624	100
Capital	2,393,800	2,009,814	84
Projects			
• Production of post-harvest manual for Vegetable / Fruit – FRU-AFACI Vote: 285-2- 2-4-2507(13) AFACI-10	2,232,000	2,232,000	100
• Post-harvest loss reduction of fruits – SDF Vote: 285-2-2-12-2507 (SDF)	57,028,500	56,613,749	99
Total	63,484,924	62,686,187	99

PROGRESS

Research Findings

Physiochemical and nutritional properties of Anona powder produced by spray drying

Annona muricata and *Annona reticulata* are common underutilized fruits in Sri Lanka; they are rich in vitamins, minerals and high content of phyto chemicals. Fruit is highly perishable and record higher post harvest losses. Spray drying is one of the techniques for food

preservation by reducing water content, water activity and microbial growth. *Annona muricata* and *Annona reticulata* powder was produced by spray drying technique showed most of the physiochemical properties have turned to the best with increasing malt dextrin level of both Anona varieties such as hygroscopicity, water activity, rehydration time, caking ability, final yield and water solubility.

Investigation of physical properties of Durian powder produced by spray drying

Durian (*Durio zebathinas*) is very famous fruits in Sri Lanka, which is rich in very good balance chemical composition with higher vitamins, minerals, and antioxidant. Their own odor, extreme taste and hard peel texture are the barriers to distribution this fruit. Value addition is very important to reduce these barriers. Durian powder was produced by spray drying technique and developed yoghurt, drinking yoghurt, flavored ice cream, cake and instant drink.

Low cost extraction of Avocado oil

Avocado records high post harvest losses in Sri Lanka due to highly perishable and seasonal fruit. Avocado oil is a good source for unsaturated fatty acids with free cholesterol. Oil extraction is one of the good solutions to reduce post harvest losses. FRU practiced a low cost heat extraction method with simple equipment. Extraction method and protocol was successful and have produced good quality Avocado oil.

Extending shelf life of Tomato using natural activated carbon

Tomato is represented higher post harvest losses due to highly perishable nature. At present, different methods are used for extending shelf life of tomato such as cold storage, modified atmosphere techniques chemical treatments and irradiation methods. FRU have investigated the possibility to extending shelf life using natural activated carbon sources. Partially burn rice husk, coconut charcoal and soft wood charcoal were used as carbon sources. Partially burn rice

husk exhibited the best performance of quality maintaining and extending shelf life of tomato than other two.

Different 1-MCP treatments for extending shelf life of TJC mango for export market

Short shelf life of TJC mango is the main issue for exporting of TJC mango by sea freight. Air freight transport is high cost and reduces the profit. FRU investigated 1-MCP treatments as aqueous and fumigation for extending shelf life of TJC mango at 15°C. 100, 500 and 1000 μgL^{-1} 1-MCP treatments were practiced as above two methods. 1000 μgL^{-1} 1-MCP aqueous treatment extend shelf life of TJC mango until 21 days. The experiment should be continuing as a lot experiment under the cold room facility.

Physicochemical, antioxidant and sensory properties of selected fruits dehydrated by combination of pre-treatments and drying methods

Vacuum drying combined with osmotic treatment retained the highest percentage of ascorbic acid in Pineapple (*Ananas cosmosus*), papaya (*Carica papaya*), and banana (*Musa saba*) among other selected drying methods combined with pre treatments. Total phenolic content and antioxidant capacity were highest in vacuum drying combined with citric acid treatment in selected fruits. In the aspects of sensory preferences, osmotically pretreated vacuum dried pineapple, banana and papaya were the most preferred.

Minimal processing and shelf life identification of Waraka (Jak fruit; *Artocarpus heterophyllus*)

Jack fruit (Waraka) bulbs treated with 30% (w/v) sugar solution + 0.5% (w/v) citric acid and packed with shrink wrap (T₃) showed better performance when considering sensory properties and storage life up to seven days. Therefore the method can be used to extend the shelf life of 'waraka' bulbs.

Antioxidant level of *Alternanthera sessilis* (Mukunuwenna) as affected by the cultivars and fertilizer applications

Colombo selection was rich in bioactive compounds compared with Piliyandala variety and both varieties of Mukunuwenna showed high antioxidant levels when they were grown using integrated method of fertilizer application.

Tomato sauce production to minimize the post harvest loss of Tomato

A technology was developed to produce Tomato sauce using Tomato powder derived from vacuum dehydration. This enables to reduce high post harvest loss of Tomato during off season and make available tomato for sauce industry during off season.

Production of Banana chips using five Banana varieties

A technology was developed to produce banana chips for five Banana varieties, Embul, Amban, Kolikuttu, Seeni & Cavendish using vacuum dehydration technology. This technology makes value addition to Banana and prevent post-harvest loss. People can eat nutritious and safe banana snack.

Mango powder production through vacuum dehydration and used it for other product developments

A research was successfully conducted to develop a technology to produce mango powder (Karthakolomban, Villard and Tom J. C.) through vacuum dehydration and make use of it in food industry; Jam, R.T.S., cordial, cake, yoghurt, drinking yoghurt.

Usage of vacuum dehydration technology for vegetables

Vacuum dehydration technologies were developed for vegetables, Bitter gourd, Tomato, Kohila, Lime, Gotukola, Mukunuwenna, curry leaves, jak, tender jak etc.

Value added product developments

Food processing technologies were developed for bottling of Mandarin, Mangosteen R.T.S, Carrot R.T.S, Beetroot R.T.S, Jambu chutney.

Progress of Special Projects

Post harvest management and value addition of fruits in production catchments of SAARC countries (SDF Project)

This project was implemented under the SAARC (SDF) funds to minimize post harvest losses of fruits in Sri Lanka. Under FRU management and technical guidance, five fruit packing houses and five fruit processing centers have established in different fruit grown regions, such as Anuradhapura, Dambulla, Gampaha, Matale, Mulativu, NuwaraEliya and Kandy. Seven farmers/beneficiaries groups have formulated under these centers. At present base line

survey, infrastructure development, supplying of machinery and equipment, training, Market development have been completed almost expending 83 million Rupees. Several packing and processing centers such as Mulativu, Kandy and Nuwara Eliya have been started the fruit packing and processing.

Post harvest loss reduction of fruits and vegetables of Asia through the production of manuals and application of improved technology in the field (AFACI)

Three post harvest manuals were developed. Field applications of improved technologies (postharvest technology and value added food productions) were conducted in identified areas through farmer training programs. Books, hand outs, booklets and posters have been developed under this project. Equipment and plastic crates were purchased to conduct the application of loss reduction works. One research finding was published in Asia post harvest 2017 symposium. Postharvest loss evaluation of selected fruits and vegetables is being continued.

Development

Technology dissemination

Radio Programs

- Fernando H.R.P. - Subharathi (Post harvest loss reduction of fruits & vegetables), Sri Lanka Swadesheeya sewaya (SLBC) and ‘Sinhala awruddata palathuru gena nagam yamu’, Kanduruta Sewaya (SLBC)
- Senarathne S.M.A.C.U. - ‘Sarusara Udesana’ Krushi FM web radio,

Kanduruta Sewaya (SLBC), ‘Aswenna’ (Live program –Value added Food production), Kanduruta Sewaya (SLBC), ‘Krushi Charika’ (Value added Food production), Kanduruta Sewaya (SLBC), ‘Aswenna’ (Live program – Food and Nutrition through home garden), Kanduruta Sewaya (SLBC), ‘Sarusara Udesana’,(Live program-Information about Jack), Krushi FM web radio, Kanduruta Sewaya (SLBC), Mushroom products, Guwan Viduli Govi Sewaya, DOA, Cereal based soup mixtures for breakfast, Guwan Viduli Govi Sewaya, DOA, Antioxidants and leafy vegetables, Guwan viduli govi sewaya, DOA, ‘Randiyawara’ (Live program - Our food habits and food processing), Rangiri Sri Lanka, ‘Gewaththa’ - Nutrition through our home garden ,Wayamba BS, (Two programs),

- Hettiarachchi D.N. - ‘Govithenata Peyak’, SLBC
- Wickramasinghe W.R.D.M.A.K - Value added products , SLBC

TV Programs

- Dehydration of fruits, vegetables and jack, National TV, Senarathne S.M.A.C.U., D.K. Wijerathne, K.W.P.D Karandawala and Violet Rajapaksha
- FRU - Food processing and preservation, Shradda TV, Senarathne S.M.A.C.U., D.K. Wijerathne, K.W.P.D Karandawala and Violet Rajapaksha

Training Programs

Officers were conducted following training programmes related to the Post harvest

technology, food processing and packaging as resource persons at FRU.

- Cold room management (03 programs),
- Post harvest loss reduction of fruits & vegetables and Gotukola (04),
- School children and teachers training programs on post harvest loss reduction of fruits & vegetables (10),
- DOA officers workshop of food safety and reduction of food waste (02),
- DOA officers program on Fruit and vegetable dehydration, Packaging and dehydration program, Manioc products and Banana products for SDF Mulativu entrepreneurs and farmer groups of Embilipitiya farmers and Pallama respectively.

Other training programs were conducted at Food Research Unit for the following institutions during the period under review on postharvest technology and product development.

Universities - Sabaragamuwa, Peradeniya, Uva Wellassa, Wayamba, Technical Colleges and Education Department. The topics covered during these trainings were postharvest technology and food processing of Soya, rice, other cereals and pulse based products, processing of fruits and vegetables, milk based food products, food quality analysis and food processing and candied products, bites, pastes and bakery products. Packaging of raw and processed foods, Food & Nutrition, Food Safety issues, Food Security through home garden, Poly tunnel productions and Marketing were also covered in the trainings.

Officers attended for the trainings of following institutes, as resource persons.

- Provincial council, DOA – Increasing fruit consumption (Theory and practical- Two programs) and Farmers training - Nuwara Eliya and Wariyapola, Dambulla, Monaragala, Wellawaya.
- JAICA training for farmers- Post harvest technology of fruits, specially mango and vegetables
- ISTI, Gannoruwa and Bombuwela training for DOA officers- packaging of cereal and pulse products, Post harvest technology and poly tunnel crops (four programs), Fruits and vegetables for export market (Two programs), Processing and preservation of fruits and vegetables. (seven programs), Food and Nutrition through home garden, Artificial ripening and maturity indices, Food packaging (three programs) and group work, Export market oriented productions. Post harvest technology of fruits, Fruits and vegetable dehydration (Two programs), Corn products, Soya, rice and cereal products (10 programs), SDF Entrepreneurs (02 programs),
- ISTI, Gannoruwa training for SLAAS officers - Food security through home garden (two programs)
- Other Institutions - Agriculture and home science teachers; Katugasthota zone (Food preservation, packaging and labelling). National Food Promotion Board - farmers/ Muruthalawa (Jackfruit & fruit processing), Industrial Development Board, Katubedda (Mushroom products), Mahaweli Authority (Food processing), Vidatha - Pannala (Food processing), Sri Lanka Farmers' Association - Dehiaththakandiya and Monaragala (Food

- processing), Agriculture Faculty - Mahalluppallama (Food processing), Rahula College - Katugasthota (Food processing), Sri Lanka Air Force - Katunayake - (Mushroom, tomato and leafy vegetable related products)
- Providing of lectures as visiting lecturer of Technical college, Anuradhapura

Student Training/Research Programs

FRU facilitated to cover the final year research/ training programs of students from following institutes on postharvest technology and food processing. Students were comprised from the University of Ruhuna - 02, University of Peradeniya - 03, University of Sabaragamuwa - 01, University of Uva Wellassa - 01, Rajarata University - 01, Wayamba University - 06, Open University - 06, HARDI - 11, Agriculture schools - 02, DTC - 02, College of Technology - 04, Sri Lanka Advanced Technology Institute - 01.

Overseas trainings

- H.R.P. Fernando, SDF project, Postharvest technology, October 3-6 Bhutan.
- S.M.A.C.U. Senarathne, AFACI project, Annual progress meeting, July 18-22 Bangladesh.
- S.M.A.C.U. Senarathne, Asia 2017, Post harvest symposium, September 12-15 South Korea.

Workshops

- Business Advisory program- Conducted by Ministry of National policies and Economic Affairs.

- Development of Food Safety guidelines for export market- conducted by EDB (Two programs)
- Development of National food safety framework program at Waters Edge, Colombo.
- Improved production and non-market benefits from sustainable use of Agro Biodiversity at Oak Ray Regency Hotel, Kandy.

Exhibitions

Food Research Unit participated at the exhibitions of World Food Day at PGRC, Schools - CP/H/ Ginigathena Central College, CP/K/ Peradeniya Central College, CP/M/ Menikhinna M.V., CP/K/ Pushpadana Girls' College, CP/K/ Berawatts College/Ampitiya, Food Exhibition - Bombuwala and Jaffna and 'Thirasara Yugayak' exhibition- NAICC.

Laboratory Analytical Service

Quality analysis testing was done for Department of Agriculture, food processors and farmers on following products during the period under review. Reports were issued for 128 vegetables, 46 fruits, 30 yams, 223 value added products and 72 microbiological analysis reports.

Infrastructure development activities

- Construction of main gate and fence
- Renovation of roof of laboratory 01
- Construction of 2 toilets/ wash rooms

Technology generated

- Organic fertilizer usage for quality and shelf life improvement of Cucumber
- Production of Durian powder using spray drying technology

- Production of several value added products by durian powder
- Vacuum dehydration technological packages for fruits and vegetables.
- Application of reduced Ethrel volume for induce ripening of banana

PLAN FOR 2018

Research Program- 2017-2018

- Post harvest loss reduction - Different 1-MCP treatments for extending shelf life of TJC mango for export market
- Identification of an Index for bee honey according to the geography and environmental conditions.
- Identification of suitable dehydration technique for production of vegetable leathers
- Identification and evaluation of post harvest loss of selected fruits and vegetable through supply chain

- Improving storage life of papaya with edible coating
- Development of technology for vacuum dehydration of vegetables

Product Development

- Physical properties of Anona (*Annona muricata* and *Annona reticulata*) powder produced by spray drying technique.
- Investigation of low cost extraction of Avocado oil
- Investigation of important nutrition factors of Micro greens
- Investigation of suitability of banana stem and coam flour for bakery products
- Development of processed food products for fruits using vacuum dehydration technology. (Mango, Banana, Papaya, Pineapple, Anona, Star fruits)
- Development of processed food products for under-utilized fruits

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director	01	01
Assistant Director of Agriculture (Research)	05	02
Agriculture Instructor (Special grade)	01	-
Agriculture Monitoring Officer	04	-
Program Assistant (Agriculture)	03	-
Development Officer	02	01
Agriculture Instructor	02	01
Research Assistant	04	03
Public Management Assistant	02	02
Driver	02	01
Electrician	01	01
Machine Operator	01	01
Research Sub Assistant	02	02
Watcher	02	02
Laborer (Permanent)	11	07
Laborer (Contract)	03	03
Total	46	27

1.2.2 REGIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE (RARDC) - BANDARAWELA

RARDC, Bandarawela, located in the Up Country Intermediate Zone, 1400 m above mean sea level, is the main center responsible for development of appropriate technologies to enhance the yield and quality of agricultural commodities cultivated in the Uva region and Balangoda segment of Sabaragamuwa province. Its mandated area covers IU₂, IM₂, IM₃, WM₃, IL₂ and WM₃ agro ecological

regions. The center functions under the purview of HORDI, and has a satellite station at Rahangala. Other than research activities, the center involves in many technology transfer and agricultural development activities including production and distribution of quality planting materials of potato and fruit crops.

BUDGET

Table 1.2.2.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
RARDC - Bandarawela			
Recurrent	3,839,615	3,491,122	91
Capital	2,985,000	2,625,077	88
Projects			
• NARP Bean	274,000	272,398	99
• NARP Gerbera	311,500	292,422	94
• NARP Bell pepper	230,200	219,056	95
• Technological interventions to improve production and productivity of selected fruits (Strawberry)	200,000	199,538	100
• F ₁ hybrid Brinjal	80,000	79,885	100
• F ₁ hybrid Tomato	80,000	79,935	100
• NARP Tomato	292,600	266,690	91
• NARP Citrus	200,000	199,923	100
• Technological Interventions to improve production and productivity of selected vegetables	220,000	215,978	98
• ANSOFT	150,000	141,890	95
• Soil testing	200,000	174,424	87
Total	9,062,915	8,258,338	91

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
ARS - Rahangala			
Recurrent	842,965	720,098	85
Capital	1,318,270	714,543	54
Projects			
• Technological interventions to improve production and productivity of selected fruit crops (Citrus)	200,000	198,427	99
• Development of high yielding Citrus varieties (NARP)	200,000	195,157	98
• F ₁ Hybrid project	200,000	199,156	100
Total	2,761,235	2,027,381	73
Grand Total	11,824,150	10,285,719	87

PROGRESS

Crop Improvement

- Out of 150 Tomato varieties and accessions, sixty five were *in vitro* screened using four levels of polyethylene for drought tolerance. Rest will be screened.
- Thirty tomato accessions and varieties out of 150 were screened for heat tolerance and found that DOA Tomato varieties Lanka Cherry at all growing stages, Ravi at vegetative stage and Bhathiya at flowering stage showed tolerance to high temperature (40⁰C).
- Optimum gamma irradiation dosage for induced mutation of Tomato variety Katugastota Wilt Resistant was 398 Gy.
- 14 crosses (F₁ population) were made from the 159 rust screen accessions and advanced to BC₁ generation for development of rust resistant bean variety.

- 15 Pole bean lines (F₂ population) were evaluated and advanced to F₃ to develop a short age variety.
- Pole bean preliminary yield trial was initiated using 12 Pole bean lines. One variety out of 3 nominated for VAT.
- 10 Bean lines (F₂ crosses combination 2016 was released and three other Pole bean lines were nominated to NCVT and two were nominated to VAT) were selected and advanced to F₃ generation to develop a *Fusarium* root rot resistant variety.
- Seven Brinjal lines were self-pollinated to produce inbred lines to produce hybrid Brinjal varieties.

Agronomy

- A fivefold increment in seed potato yield was observed with clay pebbles (Hydrocorns): coir dust: half burn paddy husk (1:2:2) medium. Addition of clay

pebbles to Deep flow and Aeroponic systems produced twofold increase in G₀ seed potato yield.

- Potato tower filled with compost and soil (1:1) was introduced for production of G₁ seed potatoes in small scale.
- Experiments revealed that Mannar can be identified as a non-conventional area for potato cultivation. Red La Soda, Cal White, Faluka and Arnova can be recommended for Mannar while Faluka, Laperla, Arnova to Jaffna. Since Calwhite, Faluka and Arnova are easily adapted to changing weather conditions, they can be recommended for conventional potato growing areas to minimize impact of climatic changes.
- Foliar application of dry yeast (5 g/l) in two weeks and four weeks after field establishment increased lettuce yield by 30%.
- Survey on status of protected agriculture in Badulla district showed 61.24% farmers owned average 750 ft² tunnel area and major constraints identified were marketing and poor knowledge on protected agriculture.
- Poultry manure and yellow colored polythene can be used to improve the color of variety Lanka Carrot.

Soil Science

- Preliminary experiments revealed that application of phosphorous at seedling stage (3 granules/ seedling) could reduce the total application load of phosphorous without affecting yield in Tomato and Cabbage.

Horticulture

- Twelve selected promising strawberry lines were evaluated in poly-tunnels.
- Planting materials produced through MS medium, ½ MS medium with vitamins, 2% sucrose, 1 mg/l IAA, 0.6% agar at pH 5.8 and runners were evaluated.
- Six Kiwi fruits lines were selected and evaluated in poly-tunnels.

Plant Pathology

- Initiation of potato late blight observed after 5 days average temperature is below 25.5 °C and the total rainfall for the last 10 day period is ≥ 30 mm at Kahagolla and Dehiwinna whereas above 79 % of 5 day average relative humidity and above 12 °C of 7 day moving average air temperature at Komarikagoda.
- Bean rust and angular leaf spot incidence can be minimized by establishing two zigzag Maize rows as a border crop or as an inter row crop in every 8 rows of Bean.
- Drenching half burnt paddy husk with Thiophante methyl 70% WP in 7 days interval starting from 2 weeks after seed establishment until pod initiation suppressed the bean root rot.
- Eight Gerbera cultivars showed immune to powdery mildew under natural infection.
- 100 Pole bean lines were screened against bean rust (*Uromyces appendiculatus* (Pers.) and no resistant lines identified.
- Tebuconazole 25% WG (3.5 g/10 l), Triforine 190 g/l DC (15 ml/10 l) and Chlorothalonil 40% SC (30 ml/10 l) were

recommended to control rust, angular leaf spot and anthracnose in Bean.

- Chlorothalonil 720 SC (20 ml/10 l) and Mancozeb 75% WG (20 g/10 l) were recommended to control Tomato early blight.

Entomology

- CFL Light traps (8W) were effective in mass trapping of *Tuta absoluta* (Tomato leaf and fruit miner) adult moths (average 250 adults per trap per day).
- Abamectin 18 g/l EC (6 ml/10 l), Emamectin benzoate 5% SG (4 g/10 l), Spinetoram 25% WG (2.5 g/10 l) and Indoxacarb 150 g/l EC (4 ml/10 l) effectively controlled larval stages of *Tuta absoluta* in green houses.
- Neem based insecticides were evaluated in the laboratory against whitefly (*Bemisia tabaci*) in hydroponically grown potato and 8 ml/10 l was identified as the most effective dose of Azadirachtin F 5.0%.
- Azadirachtin F 5.0% (8 ml/10 l) effectively controlled whitefly (*Bemisia tabaci*) in hydroponic systems.
- Cabbage leaf eating caterpillar damage was reduced by the application of sodium silicate as a seedling treatment; foliar application or soil drench.

Floriculture

- 20 Gerbera lines of F₁ population were evaluated to develop local Gerbera varieties.

- Plants grown in Top soil: Sand: Partially burnt paddy husk: Cattle manure (4:2:2:1) medium was superior for Chrysanthemum.
- A growth medium with soil, partially burned paddy husk and compost (8:2:1) was identified as the best medium for vegetative and reproductive growth of miniature roses. If compost is substituted with cattle manure it increases the vase life by one week.

Tissue Culture

- Low cost bio reactor system for production of Lily bulblets was identified.

Seed and Planting Material Production

- Micro propagated potato var. Granola (2940), Strawberry (30), Gerbera (90) and Baby's breath (25) and certified budded plants of Mandarin (6377), Sweet orange (892) and grafted plants of Pear (212) were produced.
- 50 kg of DOA-SCS certified breeder seeds of Lanka Butter were produced at ARS, Rahangala.
- Certified plants of Arogya (508), Bibile sweet (194), Sisila (236), Rahangala mandarin (682), Ehime-I (446), Ehime-II (208), Ehime-III (210), Pear (3100), Peach (35), Guava (572), Passion fruit (80), Macademia (80), Strawberry (420), Pomegranate (42) and Grapes (76) were produced at ARS, Rahangala.

Analytical services

- Soil test based fertilizer recommendations were given for 1200 farmers.

PLAN FOR 2018

Plant Breeding

- Development of high yielding and high quality vegetable varieties.
- Development of climate resilient vegetable varieties

Agronomy

- Evaluation of different aeration methods for hydroponics to increase tuber yield of potato.
- Evaluation of potato tower method on G₁ seed production in farmer fields.
- Development of suitable agronomic management practices for Beans, Tomato, Carrot and salad Cucumber.
- Identification of suitable water conservation methods for Tomato

Soil Science

- Studies on the use of Phosphorus in vegetables. Evaluation of application of micro nutrients on Cabbage and soils in long term
- Calibration of N,P,K levels in soil to develop site specific fertilizer recommendations for Bean, Cabbage and Potato.

Horticulture

- Development of high yielding Strawberry varieties and Apple varieties with low chilling requirements.

Pathology

- Survey on distribution of fungal bean yellowing in Bandarawela area.

- Assessment of correlation between soil physical and chemical properties with disease incidence of bean root rot.
- Assessment of Salicylic acid induced resistance in Cabbage plants against black rot

Entomology

- Development of eco-friendly cost effective pest management options for vegetables. Influence of Sodium silicate in induction of resistance to insect pests in Pole bean and Cabbage (Continue previous year experiments)
- Efficacy evaluation of new insecticides against insect and mites pests of vegetables grown in Up Country Intermediate Zone.

Other Information

Varieties Released

- Pole bean PB 161 was conditionally released for general cultivation in VRC, 2017
- Passion fruit BWPF 1401 was released as Bandarawela purple for Up Country Intermediate and Wet Zone .
- Advices on pest and diseases management were provided to 107 farmers who cultivate vegetables, fruits, flower crops and Potato.

Technologies disseminated

- Training programs were conducted for more than 976 personnel of different categories (farmers, university students, school children, and officers from other

government organizations) on various agricultural activities.

Exhibitions/ Field programs conducted

- Field day on “Seed potato production techniques” with the participation of researchers, extension officers, and farmers at RARDC, Bandarawela

Trainings received

- J.A. Samanthi participated the Seminar on Agricultural Biotechnology Applications for Developing Countries in China.
- G.A.R. Somasiri participated the Training Course on Bio Control of Crop Pests and Diseases for Developing Countries in China.

- W.M.S. Gunasekara participated the Workshop on integrated technology for preventing and controlling diseases and insect pests of major crops in southern and Southern Eastern Asian Countries in China.
- S.M.U.I. Samaraweera participated the Training on Potato cultivation and extension technologies for developing countries in China.
- M.D.D. Costa participated the Seminar on JUNCAO industry for developing countries in China.

STAFF LIST

RARDC, Bandarawela

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	12	10
Administrative Officer	01	01
Agriculture Instructor (Supra)	01	-
Research Assistant (Supra)	01	01
Economist Assistant	01	01
Agriculture Monitoring Officer	02	-
Program Assistant (Agriculture)	09	07
Development Officer	02	02
Agriculture Instructor	05	06
Research Assistant	10	10
Engineering Assistant	01	-
Public Management Assistant	08	11
Technological Assistant (Engineering)	01	-
Technological Assistant (Agri. Extension)	01	01
Farm Clerk	01	01
Driver	05	04
Tractor Operator	01	01
Store Keeper	01	01

Designation	No. Approved	No. Existing
Mechanic	01	01
Carpenter	01	01
Mason	01	01
Electrician	01	-
Technician	02	01
Research Sub Assistant	03	02
Budder	02	01
Circuit Bungalow Keeper	01	01
Office Employee	01	02
Watcher	10	07
Laborer (Permanent)	75	63
Laborer (Contract)	08	-
Total	170	138

ARS, Rahangala

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	03	01
Agriculture Instructor	03	02
Research Assistant	03	01
Public Management Assistant	02	02
Technological Assistant (Research)	02	01
Farm Clerk	01	01
Driver	01	01
Tractor Operator	01	01
Research Sub Assistant	01	01
Budder	02	02
Watcher	05	05
Laborer (Permanent)	40	21
Laborer (Contract)	03	03
Total	67	42

1.2.3 REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE (RARDC) - MAKANDURA

Regional Agricultural Research and Development Centre (RARDC) at Makandura caters the agricultural research and development needs of the Gampaha, Kurunegala and Puttalam districts. Two Adaptive Research Units located at Tabbowa and Wariyapola and Agriculture Research Station located at Kalpitiya are linked to strengthen the program of the Center in handling location specific research and development activities.

The research and development activities of the Center are focused mainly on developing

technologies for coconut based cropping system to enhance the productivity of coconut lands. Technologies are developed for the vegetables, root and tuber, mushrooms, mandated fruits, and also for floriculture.

While catering the national priorities of the Department of Agriculture (DOA), research efforts of the Center are directed at specific provincial needs. The Centre has established linkages with other institutes and centers of the DOA and outside organizations to carryout commodity and factor research activities.

BUDGET

Table 1.2.3.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Regional Agricultural Research & Development Centre, Makandura			
Recurrent	5,532,097	4,294,809	78
Capital	3,373,000	2,956,709	88
Projects			
• Development of correct fertilizer management package	2,676,000	2,455,618	92
• Use of Entomo - pathogenic fungi to control shoot and fruit borer in Brinjal	272,900	268,793	98
• Hybrid variety and open pollinated variety development Program	1,730,000	1,726,199	100
• Development of Okra breeding lines having resistance/ tolerance of Yellow Vein Mosaic Virus with comparable yield	606,800	576,220	95
• Planting material production of sweet potato and manioc	400,000	367,062	92
• Technical intervention to increase production and productivity of selected vegetable crops	100,000	59,976	60
Total	14,690,797	12,645,410	86

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Agriculture Research Station, Kalpitiya			
Recurrent	589,575	555,284	94
Capital	1,342,000	109,592	8
Projects			
• Fruit Village Development Program	500,000	312,972	62
Total	27,431,575	977,848	40

PROGRESS

RESEARCH

Vegetable Breeding

Pumpkin

- Purified Vilachchi line (Mk Spanchy) was evaluated in NCVT in 9 locations.
- Multiplication of 500 g of Mk Spanchy by keeping the purity at 90% was completed.
- An experiment to identify suitable spacing for pumpkin cultivation was completed.

Ash pumpkin

- Ash pumpkin/ Ash Gourd (*Benincasa hispida*), promising progeny was selected and purified further up to the level of 90% with the expected characteristics. The sixth advanced generation was tested in farmer fields. Fruits having low length: width ratio, barrel shape and weight of more than 10 kg consisted over 60% of the harvest.

Seeds of this size and farmer grown land races were distributed among 20 farmers of North Western province representing all ash gourd growing areas in Maha 2017/18 season.

Capsicum

- Population of cultivar “Bullnose” was advanced to 6th generation during Maha 2016/17. Plants with desirable characteristics such as color, shape of the blossom end and size of the pods were selected.

‘Nai miris’

- Population was advanced to 6th and 7th generation respectively. Extreme hot weather situation was favorable to screen the population for virus resistance or tolerance under unsprayed condition. Five progenies with desirable characters were selected for further purification.

Sweet Cucumber

- Germplasm was collected from farm fields.

Luffa

- Ten lines with high yielding ability under high temperature condition were selected and they were advanced to F₂ generation. Thirty lines were selected from F₃ population and 6 lines were advanced up to F₄ with recurrent selection. Two lines were advanced up to F₅ generation and

found that their plant vigor and yield significantly lower due to inbreeding depression. 8 lines were advanced up to F₂ generation and 6 lines were advanced up to F₃ generation. Seeds of each generation were produced for generation advancement with recurrent selection and sib mating to develop inbred line.

- Four exotic Luffa (No. 114, LF 3501, LF 3521, LF3522) varieties were evaluated.

Okra

- 15 lines were developed in F₂ generation, and 3 lines were field established for generation advancement up to F₃. 37 breeding lines were developed in F₄ generation and they were field established to advance up to F₅, and 25 lines were field established for generation advancement up to F₃. Four lines were advanced up to F₂ and 12 initial crosses were made.
- 133 Okra lines were screened against major abiotic stresses at ARS, Kalptiya. Two exotic lines having field resistance to YVMV and 4 local cultivars having moderate resistance to YVMV were identified.
- Four exotic Okra hybrids were evaluated.

Bean

- Thirty seven bean lines were screened during late Yala season for heat tolerance during reproductive stage.

Fruit Breeding

- A Pomegranate variety was submitted to VRC and it was released as 'Kalpitiya Hybrid'.
- All Pomegranate cross combinations having B (Nayana) as a parent produced hard seeds and significant heterobeltiosis for plant height, canopy width, and days to 50% flowering in CxD cross combination. Significant heterobeltiosis of weight of 100 arils was seen in AxD and CxD cross combinations and of juice volume/100 arils in AxD cross combination. Considering the breeding objective, AxD and CxD crosses can be identified as better cross combinations with satisfactory level of preferable characters (peel colour, higher weight of arils, juice content, Brix, soft seeds) than other cross combinations and available cultivars. Selected plants of CxD cross combination are vegetatively propagated to multiply mother plant stock to produce grafted plants for commercial cultivation.
- Pomegranate hybrid CxD (133) was nominated in VRC 2017.

Root & Tuber Crops

- Germplasm of was collected and evaluated. Two accessions were selected based on distinctive characters of presence of antioxidants and carotenoids. Preliminary yield trials were completed.

Floriculture & Tissue Culture

- Six cut flower Anthurium lines with white colour spathe and different colour combinations of spadix were selected

from progenies derived from Lanka Kumari x Eternity cross for further evaluation.

- One greenish white Anthurium line obtained from mutation breeding program was selected for further evaluation.
- Protocol development for planting material production of greenish white Anthurium line obtained from mutation breeding was started.
- Five Anthurium plants with different colour combinations (red, pink, orange, coral and bicolor) derived from Anthurium hybridization program were selected for further evaluation.
- Plantlets obtained from hybridization between different *Dendrobium* spp. were grown in the tissue culture laboratory and in the net house.
- Marigold improvement program was initiated and F₃ generation was established in the field.
- Ten Gemplasms of Jasmine were established in the field for evaluation.

Entomology

- *Metarhizium anisopliae* fungi were mass cultured in PDA media. Shoot and fruit borer larvae were reared in insectaria for the lab experiments.
- The relevant pheromone which is in the wires was imported and white sticky traps, applied the protection glue was very effective to control sweet potato weevil. A water trap also was developed and research is continuing.

- Different plant repellents were studied to control blister beetle (*Mylabris spp.*) in Okra. Frequent application of plant repellent/s reduced the pest population.. Blue color containers with 25 cm of diameter were significantly effective to trap Blister beetle as an environment friendly method.

Pathology & Mushroom

- Log cultivation and bag cultivation of *Ganoderma lucidum* (Reshi mushroom) were successfully tested. Samples of *Ganoderma* were submitted to the FRU, Gannoruwa to analyze important properties.
- Collection of mushroom and mother culture production and spawn production completed. Experiment was started to select suitable growing medium.
- Experiments were conducted and successfully cultivated two mushroom varieties (Shitake and Eryngii).
- Experiment to re-identify causal agent/s and management of Leaf Twister Disease (Disco) of red onion in Kalipinya peninsula was completed.
- Construction of the model mushroom farm at Munamaldeniya was completed.
- Ten farmers were selected with the help of North Western Provincial Department of Agriculture to establish a mushroom village. Insect proof nets and misting units were distributed among farmers.

OTHER

Seed and Planting Material Production

Following amounts of planting material were produced and sold/ issued.

Table 1.2.3.2: Planting material production

Crop	Type of material	Quantity produced	Quantity sold/ issued
Anthurium	Plants	600 No.s	244 No.s
Banana	Suckers	7,602	6,602
Cassava	Sticks	15,000 m	1,000 m
Sweet Potato	Cuttings	25,000	-
Dragon Fruit	Plants	1,500	1,296
Pineapple	Suckers	55,000 No.s	43,750 No.s
Pumpkin (Improved line)	Seeds	500 g	-
Yard long bean (A9)	Breeder seeds	5 kg	-
Bitter gourd (Thinnavelly white)	Breeder seeds	500 g	-

Advisory Services

Table 1.2.3.3: Number of provided

Field	No. of Advisory provided
Mushroom	240
Pineapples	320
Floriculture	132
Home garden	50
Root & Tuber	60
Dragon Fruit	45
Banana	85
Pathology	135
Entomology	70
Vegetable	165

Technology Dissemination

Following farmer trainings were conducted.

Table 1.2.3.4: Farmer trainings conducted

Topic of the program	No. of Trainings	No. of participants
Vegetable cultivation	16	600
Nursery management	08	350
Floriculture	09	502
Mushroom	12	520
Fruits	03	240

- Leaflets on Mushroom, Dragon fruit, Vegetable cultivation and Pest control were distributed.
- Three workshops for farmers were conducted on Mushroom cultivation.
- Soil (500 No.s), compost (273 No.s) and water (76 No.s) of samples were analyzed.

Trainings, Conferences & Workshops Attended

- Training on Vegetable Cultivation and Processing Technology for Developing Countries. 2017, China.
- Seminar on Soil and Fertilizer Comprehensive Management and Utilization for Developing Countries. 29.03.2017 to 27.04.2017, China.
- Training on Integrated Pest and Disease Control Methods in Major Crops. 02.06.2017 to 21.06.2017, China.
- Training on International mushroom training for South Asian Countries. 07.12.2016 to 29.12.2016, China.
- Certificate Course on Fundamentals of Molecular Biology and Biotechnology, Agricultural Biotechnology Centre, University of Peradeniya.

Radio and TV programs

- Participated to two live radio programs on Mushroom Cultivation on 'Wayama Handa' Radio and 'Rangiri Dambulu' Radio
- Participated to the TV program of 40th Anniversary of Korean embassy

Awards

- Obtained award for the best poster of the Annual Symposium of the Department of Agriculture, 2017 by Palitha Rajapaksa.
- Obtained best presenter award in the session of Plant Biology and Productivity Improvement of the Annual Symposium of the Department of Agriculture 2017 by S.A.S.M. Kumari.

PLAN FOR 2018

Vegetable

- Conducting VAT and completion of DUST for Mk Spanchy and nomination it for VRC in 2018
- Recommendation of ideal spacing for pumpkin cultivation to get maximum profit
- Continuation of purification of flat shape pumpkin lines (Mk 1 and Mk 2)
- Variety development of Ash Gourd/ Ash pumpkin (*Benincasa hispida*), through population improvement of locally available land races
- Genetic improvement and population advancement of Capsicum cultivar Bullnose
- Population improvement and population advancement of *Capsicum chinense* Jacq.
- Collection of 'Nai miris' land races

Root & Tuber Crops

- Identification of new sweet potato varieties with antioxidants and carotenoids

Horticulture

- Development of heat and moisture stress tolerance Luffa varieties
- Hybridization and generation advancement of Luffa for development of F₁ hybrid and open pollinated varieties
- Diversity analysis of *Luffa acutangula* and *Luffa cylindrica*
- Development of inbred lines of Okra
- Identification of okra lines having resistance/ tolerance of YVMV
- Planting material production of selected Pomegranate hybrid and field evaluation of grafted pomegranate plants
- Evaluation of pole bean line under the heat stress condition
- Exotic variety evaluation of Okra and Luffa
- National Coordinated Varietal Trial - Okra

Floriculture

- Crop Improvement of Anthurium, Orchid, Marigold and Jasmine through conventional breeding and mutation induction.

Entomology

- On-station and pilot scale testing of the pheromone to control sweet potato weevil
- Development of IPM package to control *Mylabris* spps. and enhance the yield
- Development of IPM package to control *Aulacophora* spp. in Cucurbitaceae

Pathology & Mushroom

- Development of value added products and other processing methods of mushrooms

- Collection of wild (naturally grown) mushroom and development of artificial cultivation technologies for three selected varieties
- Conducting extension programs for the new mushroom variety 'Makandura'
- Study on cultivation of two exotic mushroom varieties suitable for hilly (low temperature) areas and conducting extension program.
- Analysis of antioxidant and other properties of *Ganoderma* mushroom and conducting adaptive research in farmer fields
- Evaluation of new growing houses for mushroom according to the different environment condition and availability of the resources

AGRICULTURE RESEARCH STATION, KALPITIYA

PROGRESS

Research

- Conducted National Coordinated varietal trial in Chilli (From FCRDI), Mae (two Trails from HORDI), and Sweet Potato (Makandura)
- Conducted exotic variety evaluation program and tested three Beet varieties, three Cabbages varieties and three Cauliflower varieties
- Pomegranate breeding program is conducting and mother plants and grafting plants production of VRC nominated hybrid is going on
- Okra germplasm evaluation and Variety screening for YVMV is going on

- Pomegranate, Guava, and vegetable breeder seeds production is going on
- Seminar on Soil and Fertilizer Comprehensive Management and Utilization for Developing Countries. 29.03.2017 to 27.04.2017, China.

Training, Conferences & Workshops Attended

Seed and Planting Material Production

Table 1.2.3.5: Quantities of seeds & planting material produced

Crop	Type of material	Quantity produced	Quantity sold/ issued
Pomegranate	Plants	13,400	2,400
Long bean A-9	Seeds	500 g	Breeder seed
Bitter gourd- Thinnavelli	Seeds	500 g	Breeder seed
Okra (Athdala bandakka)	Seeds	3 kg	-
Brinjal	Breeder seeds	1,000 g	-
Cassava	Cuttings	10,000 m	10,000 No.s
Sweet Potato	Cuttings	25,000	10,000 No.s

Technology dissemination

Training on Vegetable and fruit cultivation was conducted for 2,050 No. of participants.

PLAN FOR 2018

- Conducting NCVT, Exotic variety evaluation programs
- Planting material production of Pomegranate, Guava, and vegetable breeder seeds
- Okra screening trials for YVMV

STAFF LIST

RARDC, Makandura

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	12	04
Assistant Director of Agriculture (Economics)	01	-
Administrative Officer	01	01
Agriculture Instructor (Special)	01	-
Economist Assistant	01	01
Agriculture Monitoring Officer	05	01
Program Assistant (Agriculture)	06	01

Designation	No. Approved	No. Existing
Development Officer	03	03
Farm Manager	-	01
Agriculture Instructor	06	07
Research Assistant	10	08
Public Management Assistant	08	08
Technological Assistant	04	04
Farm Clerk	01	02
Storeman	01	01
Research Sub Assistant	03	-
Driver	04	03
Tractor Operator	02	01
Mason	01	-
Carpenter	01	-
Mechanic	01	01
Nurseryman	-	-
Electrician	01	-
Technician	02	-
Grass Cutter	-	01
Circuit Bungalow Keeper	01	01
Office Employee	01	-
Watcher	05	05
Sanitary Laborer	01	01
Unskilled Laborer (Grade I)	63	11
Unskilled Laborer (grade III)	-	27
Laborer (Contract)	01	07
Total	148	102

Agriculture Research Station,

Kalpitiya

Designation	No. Existing
Assistant Director of Agriculture (Research)	01
Farm Manager	01
Agriculture Instructor	01
Research Assistant	02
Public Management Assistant	01
Technological Assistant	04

Designation	No. Existing
Driver	01
Tractor Operator	01
Watcher	02
Mechanic	01
Unskilled Laborer (Grade I)	05
Unskilled Laborer (Grade III)	07
Laborer (Contract)	01
Total	28

Adaptive Research Unit, Thabbowa

Designation	No. Existing
Farm Manager	01
Technological Assistant	01
Watcher	02
Unskilled Laborer (Grade I)	03
Unskilled Laborer (Grade III)	05
Total	12

Adaptive Research Unit, Wariyapola

Designation	No. Existing
Development Officer	01
Farm Manager	01
Agriculture Instructor	02
Research Assistant	01
Watcher	02
Unskilled Laborer (Grade I)	04
Unskilled Laborer (Grade III)	05
Laborer (Contract)	05
Total	21

1.2.4 AGRICULTURE RESEARCH AND DEVELOPMENT CENTRE (ARDC) - SITA ELIYA

Agriculture Research and Development Centre, Sita Eliya comes under the purview of Horticultural Crops Research and Development Institute, Gannoruwa. Potato, temperate vegetables, fruits and some floricultural crops are the commodity research focus of this station. Crop improvement program includes varietal development, introduction and selection of high yielding

varieties. Enhancement of crop productivity program includes development of improved agronomic packages and good agricultural practices for the management of pests, diseases and nutrients. The centre is responsible in conducting national programs to uplift quality and amount of seed potato, planting materials of strawberry and some ornamentals.

BUDGET

Table 1.2.4.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	3,758,767	3,640,357	97
Capital	2,420,750	2,245,985	93
Projects			
• Potato production program 2016-2018	2,800,000	2,793,222	100
• Potato seed production	7,100,000	5,881,066	83
• Development of site specific fertilizer management system for sustainable crop production	180,000	144,520	80
• Development of F ₁ hybrid and open pollinated varieties and production of basic seed	700,000	703,738	101
• Mushroom development project (KOPIA)	100,000	100,000	100
• Soil test based fertilizer recommendation for Grama Niladhari Division and efficient fertilizer management	200,000	199,376	100
• AFACI	2,703,038	2,703,038	100
• Bio intensive integrated pest management program for management of cut worm, <i>Agrotis</i> spp.	300,000	298,850	100
Total	20,262,555	18,710,152	92

PROGRESS

RESEARCH

Agronomy

- A study was conducted to select appropriate propagule of variety Granola for hydroponic system. It was found that plants obtained from seeds of rooted stem cuttings gave higher yield than plants developed from mini tubers, micro tubers and *in vitro* plants.
- Experiment was conducted to find out most appropriate planting density of Cabbage, Chinese cabbage, Broccoli and Cauliflower.

Plant Breeding

- Potato true seed nurseries under control environmental conditions were established to get F₁ seed potato tubers using single tuber selection method.
- Six locally developed Potato lines were evaluated under MYT. Four lines produced significantly higher yield over control variety.
- Promising heat tolerant Potato line YP-07-611 named as Rivola was recommended for commercial cultivation in Puttalam and Jaffna districts.
- Thirty Potato lines were evaluated in Kalpitiya and Thirunelveli Research stations, All tested lines gave lower yield compared to check variety Red La Soda.
- Twenty eight Potato varieties were established in Kalpitiya and Thirunelveli research stations to select suitable heat tolerant potato varieties for PYT.

- Eleven CIP lines were evaluated under MYT. Nine lines produced significantly higher yield over control variety.
- Thirty eight exotic Potato varieties were evaluated for yield and late blight disease tolerance/ resistance. Ten high yielding Potato varieties (Ranomi, Oxania, Aloutte, Sinora, Montreal, Mondio, Noha, Medeleine, Iryana, YP-05-130) with less disease incidence were identified.
- Eighteen exotic Potato varieties were evaluated for yield and their adaptability. Study will be repeated to identify varieties for commercial cultivation.
- Three Beet Root varieties, 7 Cabbage varieties, 6 Carrot varieties, 1 Cauliflower variety, 1 Chinese Cabbage variety, 2 Knol-khol varieties, 1 Pac Choi and 3 Zucchini varieties were evaluated. One Broccoli variety (Early You), 4 Cabbage varieties (ISZ-78, Tiger, Magnum and HLS-15), 1 Chinese Cabbage variety (PAM), 1 Knol-khol variety (NEX), 1 Pac Choi variety (N-54) and 1 Zucchini variety (Star OL) were identified based on yield, maturity, less pest and disease incidences and consumer acceptability for large scale demonstrations under UCWZ conditions.
- One Carrot Variety (Rex) and one Radish variety (Green Hope) were recommended for commercial cultivation in UCWZ.

Tissue Culture

- *In vitro* plant regeneration method was developed for Strawberry anther culture. MS medium supplemented with 2 mg/l IAA + 1 mg/l BAP was selected among four plant regeneration media, which can regenerate plants from *in vitro* derived calli of Strawberry anthers.

- Two root induction media were tested to induce rooting of *in vitro* shoot of Pears. None of the tested media was effective on rooting.

Entomology

- Sulfoxaflor 240 SC was recommended at the rate of 200 ml/ha for the control of thrips and aphids in potato.
- Metaldehyde 5% G was tested for reregistration. It was found to be effective for the management of slugs at the rate of 10-30 kg/ha.
- A study was conducted to identify the influence of climatic factors on population dynamics of sucking pests. Significant positive correlation was observed between average temperature with aphids population and significant negative correlation was observed between RH and white flies.
- An experiment was carried out to assess the yield loss of potato due to sucking pests (Aphids, Thrips, and Whitefly). The result revealed that there was a significant yield loss in untreated control compared to weekly chemical application.
- An experiment was carried out to evaluate pesticide properties of *Lantana camara*, *Eucalyptus globulus* and *Tithonia diversifolia* on control of potato tuber moth. Results revealed that *Lantana camara* is the most effective botanical. 15 g dry leaves of *Lantana camara* can be used for 1 kg of seed potato to control tuber moth in small scale stores.
- A study was conducted to determine the efficiency and effectiveness on fungi *Metarhizium anisopliae* (isolated by CRI)

against white grub in UCWZ. The fungi did not show bio controlling ability against white grub under laboratory and glass house conditions.

Pathology

- 3.75 ml/l Flopicolide 62.5 g/l + Propamocarb HCl 625 g/l SC performed better than Mancozeb 68%+ Metalaxyl 4% (2.50 g/l) in controlling late blight of Potato.
- Efficacy of Mancozeb 75% WDG @ 2 g/l was tested for late blight of Potato and found that it performed similar to Mancozeb 80% WP.
- Seventeen new exotic Potato varieties were screened against late blight under field conditions. Variety 'Sapro-mira' showed resistance against late blight.
- Among six different plant extracts, Garlic extract showed ability to inhibit *Colletroticum* spp. under *in vitro* conditions (pathogen of Strawberry Anthracnose) compared to Cinnamon oil.
- Epidemiological studies were conducted on Powdery scab of Potato in Nuwara Eliya with 5 varieties. All the varieties were affected with Powdery scab.

Soil Science

- Study conducted to determine the phosphorus requirement for Potato found that P₂O₅ requirement of the crop was 62.5 kg/ha.
- An experiment was conducted to study the response of vegetable crops in a cropping sequence to N,P,K fertilizers in UCWZ. It was found that Potato requires N-100 kg/ha, P₂O₅-50 kg/ha, K₂O-100

kg/ha, Carrot requires N-100 kg/ha, P₂O₅-100 kg/ha, K₂O-100 kg/ha and Cabbage requires N-100 kg/ha, P₂O₅-100 kg/ha K₂O-150 kg/ha.

- A study conducted in high P₂O₅ containing soils for 3 seasons showed that Potato, and Carrot crops gave good yields without application of phosphorus.

Mushroom

- An experiment was carried out to develop appropriate technology for king Oyster (*Pleurotus eryngi*) cultivation. Substrate with 73% saw dust and 25% rice bran gave higher yield.
- An experiment was conducted to develop appropriate technology for Shiitake

(*Lentinula edodus*) cultivation. The medium with *Albizia lebbek* saw dust gave higher yield.

- A study was conducted to develop low cost substrate for American Oyster (*Pleurotus ostreatus*) using different combinations of composted paddy husk with saw dust. Up to 40% composted paddy husk can be added to saw dust without affecting the yield of American Oyster mushroom.

Fruits

- Eight Pears varieties were evaluated and 'Nuwara Eliya selection' performed well under UCWZ conditions .

SEED AND PLANTING MATERIAL PRODUCTION

Following amounts of seeds and planting material were produced.

Table 1.2.4.2. Seed and Planting material production during 2017

Crop	Variety	Type	Quantity (No.s)
Potato		Pre basic seeds (G ₀)	171,395
	Granola	<i>In vitro</i> plantlets	17,931
	Arnova	<i>In vitro</i> plantlets	231
	Red Lasoda	<i>In vitro</i> plantlets	253
	YP-07-611	<i>In vitro</i> plantlets	165
		<i>In vitro</i> micro tubers	610
Strawberry		<i>In vitro</i> plantlets	1,302
Baby's breath		<i>In vitro</i> plantlets	15,455
Madonna lilly		<i>In vitro</i> plantlets	11
Gerbera		<i>In vitro</i> plantlets	73
Chrysanthemum		<i>In vitro</i> plantlets	2,442
Statice		<i>In vitro</i> plantlets	358
Limonium		<i>In vitro</i> plantlets	252

SERVICES

- Soil samples received for determining soil properties and contamination for diseases were analyzed and reports as given below were provided.

Table 1.2.4.3: Analytical services provided during the year 2017

Purpose	Number
Potato cyst nematode	850
Bacterial wilt	870
pH	1,273
EC	1,273
Phosphorus	1,273
Potassium	1,273
Organic Matter	1,172

- Diseases of 17 plant samples submitted by the farmers were identified and control recommendations were given.

TRAININGS, CONFERENCES & WORKSHOPS ATTENDED

- Soil and fertilizer comprehensive management and utilization for developing countries, China.
- Seed potato multiplication and diseases integrated control techniques, China.
- Potato production and extension technologies for developing countries, China.
- JUNCAO technology for belt and road countries, China.
- Vegetable production, Egypt.
- Progress review meeting of AFACI project, Indonesia.

OTHER

- Participated at research and extension dialogs organized by Provincial Department of Agriculture at Walapane, Kothmale and Nuwara Eliya.
- One B.Sc. undergraduate student completed final year specialization project in Entomology.
- Twenty one students from National Apprentice and Industrial Training Authority were trained for their industrial training.
- 327 university students, 587 agriculture school students, 2,960 school students, 128 agriculture related officers and 435 farmers were trained on Potato cultivation, Potato seed production, tissue culture, floriculture, Strawberry cultivation, protected culture, pest and disease management, up country vegetable cultivation, home garden and soil conservation.
- One field day was conducted.
- This station participated in April Blooms 2017 organised by Municipality Council of Nuwara Eliya winning places in competition events.
- Entomology laboratory was renovated.

PLAN FOR 2018

- Development and improvement of technology for quality seed potato production.
- Development, identification, improvement and selection of suitable potato varieties for local cultivation.
- Development of technologies for environmental friendly pest and disease

- management methods for UCWZ crops to ensure seed and food security.
- Selection of suitable temperate vegetable varieties for UCWZ cultivation.
 - Development and improvement of adaptable *in vitro* propagation technique for seed potato and temperate fruit crop production.
 - Development and identification of environment friendly fertilizer management practices for UCWZ cropping systems
 - Development and improvement of technology for new mushroom types suitable to UCWZ.

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director (Research)	09	04
Administrative Officer	01	-
Agriculture Instructor (Special Grade)	01	-
Research Assistant (Special Grade)	01	-
Agriculture Monitoring Officer	-	01
Program Assistant (Agriculture)	03	-
Development Officer	02	-
Agriculture Instructor	03	03
Research Assistant	07	03
Public Management Assistant	03	03
Tecnological Assistant	06	06
Farm Clerk	01	-
Driver	03	03
Tractor Operator	01	01
Store Keeper	01	-
Electrician	01	-
Research Sub Assistant	03	-
Office Employee	01	01
Watcher	06	06
Laborer	44	36
Laborer (Contract)	27	25
Total	114	68

1.2.5 AGRICULTURE RESEARCH STATION (ARS) - TELIJJAWILA

Agriculture Research Station, Telijjawila, functions under the purview of HORDI, Gannoruwa. Research and Development activities at ARS, Telijjawila are mainly focused on developing and disseminating technologies pertaining to productivity improvement of vegetables, root and tuber

crops, fruits and mushrooms. In addition emphasis was given for the production and distribution of planting materials, training and education of extension staff and farmers to ensure the sustainability of the crop production particularly in the southern region of Sri Lanka.

BUDGET

Table 1.2.5.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,873,179	1,481,453	79
Capital	2,304,000	2,033,773	88
Projects			
• NARP – <i>In vitro</i> mutagenesis of banana for <i>Fusarium</i> wilt (<i>Fusarium oxysporium</i> f.sp. cubense (Foc)) resistance/tolerance	180,000	179,996	100
• NARP Present status and future implications of floriculture sector in Matara District	445,500	444,926	100
• Technological intervention to improve production and productivity of selected vegetable varieties	130,000	130,000	100
• Sweet potato and Cassava cultivation to overcome food shortage in the country due to prevailing drought	200,000	197,605	99
• NARP - Development of high yielding high quality 'Innala' variety for Sri Lanka	718,000	680,887	95
• Development of F ₁ hybrids and open pollinated varieties of Brinjal	550,000	508,367	92
• KOPIA Project	100,000	96,128	96
Total	6,500,679	5,753,135	89

PROGRESS

RESEARCH

Plant Breeding

Chili

Forty germplasm of traditional Chilli (*Capsicum chinense*) were evaluated and 8 elite lines were purified up to 70 percent and 12 lines were submitted to Plant Genetic Resources Centre, Gannoruwa for conservation.

Yard long bean/ Vegetable cowpea

- Thirty Vegetable cowpea germplasm were obtained from PGRC and evaluated. Accession No.s 012124 and 08766 were identified as basal rot tolerant and moderately tolerant, respectively.
- Development of high yielding, basal rot tolerant, high quality 'Polon mae' variety through hybridization and selection is ongoing.

Brinjal

- Collaborative program of NCVT Brinjal (Hybrid) was conducted and found EGH 10 and EGH 11 performed better under Low Country Wet Zone conditions.
- Development of inbred lines for high yielding, high quality 'Lenairi' type Brinjal for F₁ hybrid (with rounded end) development is ongoing.

Root and Tuber crops

- Twenty four different 'Innala' lines were evaluated and 20 lines were submitted to PGRC for conservation under *in vitro* conditions.

- Six elite lines were selected for yield evaluations.
- Two Farmers' field demonstrations were established in Matara district. 'Katu Ala' can be established through botanical seeds without compromising the average yield.
- Cost effective trellising method was identified for *Discorea* spp cultivation.

TISSUE CULTURE AND BIOTECHNOLOGY

In vitro mutagenesis of banana for Fusarium wilt (*Fusarium oxysporium f.sp. cubense (Foc)*) resistance/ tolerance (NARP funded project)

During the year 600 shoot tips of banana variety 'Agra' were irradiated using ⁶⁰Co source, at Gamma Centre, Biyagama, multiplied and *in vitro* screened to select the surviving plants.

Screening against *Fusarium oxysporium* f. sp. *Cubense (Foc)* done using 3 different *Foc* inoculation methods were tested for early screening and found injection method plus adding of 3 ml to the pots (with 1.0x10⁶ spores/ml (Approx.)) resulted early and higher infection rate in double pot system. *In vitro* screening was conducted with fungal co-cultivation method and recovered 1 plant and is being further evaluated. 2,375 No.s of plants were screened in double pot system and 210 plants were newly established in sick plots. One plant which was surviving for 18 months and produced a bunch in sick plot was selected for molecular confirmation.

Tissue Culture

- 'Innala' tubers can be produced in coir dust: sand (2:1) and sand only media using

tissue cultured plants. Tubers can be early harvested i.e. 3 months after planting and the harvested tubers could be germinated with 50 ppm GA₃ after storing in refrigerator. The tubers harvested 5 months after planting can be germinated without GA₃. The experiment will be repeated to validate the results.

- Experiment on *in vitro* tuberization of *Dioscorea alata* (Raja ala) showed that the 6 media combinations (MS+2 mg/l BAP with 30, 60 and 80 g/l sucrose in liquid and solid forms) used in the study did not result reasonable No. of tubers.

Floriculture

Development of new *Dendrobium* varieties

- One dwarf plant was identified which produced through gamma irradiation. Selection is continuing to identify novel types.
- Anthurium and orchid cultivation technologies were demonstrated in a shade houses.

PLANT PATHOLOGY AND MUSHROOM

- Feasibility study on domestication of 'Urupaha' was successfully completed.
- 'Urupaha' and two other wild mushrooms were successfully domesticated and these can be cultivated using softwood saw dust substrate or in a mixed substrate.
- Spawn production of exotic mushroom was initiated and work is in progress.

SOIL SCIENCE AND AGRONOMY

- 'Innala', some varieties of sweet potato, *Dioscorea* and Cassava could be successfully cultivated in Sorjan system if the land is protected from flood.
- The soil chemical properties (EC and pH) have been very much improved in Sorjan system over the past 3 years when compared to the original conditions.
- The chemical analysis of invaded weed commonly known as 'Tikiya' (*Eleocharis acuta*) can be used for composting.

DEVELOPMENT ACTIVITIES

- National Food production program - Technological intervention to improve production and productivity of selected vegetable varieties: Popularization of traditional seed varieties (7 crops) – Seed distributed for selected home gardens in Matara (475 farmers) and Hambanthota (202 farmers) Districts.
- The survey conducted to identify present status and future implications of floriculture sector in Matara District. Data were collected from 300 growers. Lack of marketing facilities, lack of capital for expansion, lack of infrastructure facilities and lack of quality planting materials were identified as major constraints to develop floriculture sector in Matara District.
- Sweet potato and Cassava cultivation to overcome food shortage in the country due to prevailing drought: This program was conducted in collaboration with HORDI and main activity was to produce Sweet potato and Cassava planting materials for the farmers. (Issued at free of charge for farmers who have below 0.5 ac extents).

- Stakeholder discussions along with farmer survey revealed that flooding is the main issue for fallowing paddy lands in Akuressa Agrarian Service Division.
- 200 ac land was identified for a pioneer project to cultivate paddy in Akuressa Agrarian Service Division. Farmer survey was conducted and found that the financial support is expected by farmers for land preparation to re cultivate.
- Root and tuber crops were introduced to increase the land productivity of Nilwala river basin area.

TECHNOLOGY DISSEMINATION

Table 1.2.5.2: Training programs conducted during 2017

Training program	No. of classes	No. of participants
Orchid and Anthurium cultivation	25	486
Home gardening	16	475
IPM practices	16	475
A/L student and open university student training	01	91
Student training NVQ 4 and 5	-	03
Foliage cultivation and export oriented training program	01	268
Tissue culture (with low cost techniques)		03

Seed & Planting Material Production

Table 1.2.5.3: Production of seed and planting material during 2017

Planting material	Crop	Variety	Production
Cuttings	Sweet Potato	Gannoruwa White	15,130
		Other	200,000
	Manioc <i>Dioscorea</i> spp.	Kirikawadi	1,000
		Tubers	5 kg for 60 farmers
		Plants	200 for 30 farmers
	Innala	Selected lines	500 kg
Seeds (Traditional)	Alanga	-	500 g
	Halmassan Dambala		300 g
	Traditional Mae		4 kg
	Winged bean		100 g
	Rathu Mae		2 kg
	Yard long bean	A 9	3.9 kg breeder seeds
Tissue culture	Banana (Different varieties)	744 Nos. of plants	
	Orchid (Dendrobium)	65 Nos. of community pots (3250 plants)	
		13 Nos. of <i>in vitro</i> cultures	
		1193 Nos. of 2" net pots	
Spawn	American oyster	200 g packs	2326

Conferences/ Seminars attended

- Symposium on Floriculture Research, 2017 at Royal Botanic Garden, Peradeniya.
- Seminar on Agricultural Biotechnology Application for Developing Countries from 07.06-2017 to 06-07-2017. Beijing China.
- Training on Juncavo Technology for Road and Belt countries (7 Weeks)
- Training on Green control of crop pest control and diseases for developing countries from 03.05.2017 to 01.06.2017 in China.
- Tamil language training (100 hrs.) for officers and Laborers.

PLAN FOR 2018

- Development of high yielding, high quality 'lenairi' type Brinjal F₁ hybrid variety with round shape
- Improvement of Brinjal through induced mutation
- Development of high yielding, basal rot tolerant, high quality 'Polon mae' variety through hybridization and selection is ongoing.
- Yield evaluations of six elite 'Innala' lines (MYT/NCVT)
- Micro propagation of selected mutants of 'kolikuttu' and further testing on agronomic traits.
- Tuberaization studies of 'Innala' (*Solenastemon rotundifolius*)
- Development of new varieties of Dendrobium orchids: Screening and micro propagation of selected mutants.

- Identification of plant parasitic nematodes with their severity in leafy vegetables and tuber crop (Innala) in Matara district and mapping nematode distribution pattern using GIS.
- Effect of spent oyster mushroom substrate (SMS) and Partially Burned Paddy Husk (PBPH) to control root knot nematodes in 'Innala'.
- Population dynamics of Cucurbit virus vectors against the changing pattern of climatic factors.
- Optimization of cultivation protocols for 'Urupaha' and milky mushrooms.
- Identification of diseases associated with *Diascorea* and Cassava in field and at storage.
- Identification of technologies to improve the productivity of lands of Nilwala flood protection scheme.
- Experiment on suitability of foliar fertilizer on vegetables.
- Experiment on year round production of 'Innala' using tissue cultured plants.

Development program

- Introduction and popularization of root and tuber crops for the farmer families of Nilwala river basin area.

Planting material production

- Orchids (Dendrobium) will be produced through micro propagation for the local growers.
- Mushroom spawn production

Training programs

Home gardening, Orchid and Anthruium cultivation, Integrated pest management practices, Foliage cultivation, Mushroom

cultivation and cultivation of Sweet potato on micro propagation (with low cost options).
 'Gannoruwa white' in polysack bags, Training

STAFF LIST

Designation	No. Existing
Deputy Director (Research)	01
Assistant Director of Agriculture (Research)	03
Assistant Director of Agriculture (Development)	02
Program Assistant (Agriculture)	03
Development Officer	03
Agriculture Instructor	04
Research Assistant	03
Public Management Assistant	02
Technological Assistant	02
Farm Clerk	02
Driver	02
Tractor Operator	01
Storeman	01
Research Sub Assistant	02
Office Employee	01
Watcher	06
Laborer (Permanent)	24
Laborer (Contract)	06
Total	68

1.2.6 AGRICULTURE RESEARCH STATION (ARS) - GIRANDURUKOTTE

The Agriculture Research Station, Girandurukotte, is mainly responsible for the development of agriculture research technologies to improve farm productivity while sustaining the agriculture environment and ecosystem in Mahaweli System C. It also engages in specific agriculture development activities which have been considered as

nationally important. Presently it functions under the administrative control of HORDI Gannoruwa.

In addition to the research and development program the research station serves as the main agriculture related training provider to officers, farmers, school children and relevant personnel of other organizations.

BUDGET

Table 1.2.6.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	3,843,081	2,878,395	75
Capital	2,516,000	457,698	18
Projects			
• Development of F ₁ hybrids and open pollinated varieties and production of basic seeds	800,000	745,564	93
• Conservation and characterization of selected fruit germplasm using molecular methods for establishment of Bio- diversity garden of tropical fruits at Girandurukotte	1,271,000	1,118,212	88
• Planting material production of tuber crops	100,000	79,600	80
Total	8,530,081	5,279,469	62

PROGRESS

RESEARCH

Evaluation of locally collected 'Elabatu' lines

Three lines S₆, 18 lines S₅, 9 lines S₂, 2 lines S₁ and 8 lines were selected for preliminary yield trial and 4 lines were selected as higher yielders. All lines were sent to HORDI for

pathology and entomology screening. Seed production program were completed for NCVT selected lines. Four lines were identified for NCVT program.

Okra Crop Improvement

28 different lines at F₃ generation level and 17 new were lines selected from F₂ segregated population and all lines were morphologically characterized. Five new exotic germplasm

were added to the program. All possible crosses were made.

Tomato heat screening trial

Twelve different lines were tested with three check varieties. Flower characters and yield parameters were recorded and four different lines were selected.

Development of inbred lines

Three promising lines were identified and preliminary yield trials were completed.

NCVT

National coordinated varietal trials for following vegetables were carried out.

Table 1.2.6.2: NCVT conducted for vegetables

Crop	2016/17 Maha	2017 Yala
Brinjal	05 hybrids, 02 OPV's	02 OPV's, 01 hybrid
Mae	06 varieties	
Pumpkin	05 varieties	

Traditional vegetable purification and seed production program

Seed production of two red Okra lines and one 'Mahaweli mae' line were completed.

Plant growth regulator testing

Six PGR testing trials were completed, one PGR testing trial is in progress.

Screening Brinjal accessions for shoot and pod borer resistance

PGRC germplasm, new breeding lines and some wild relatives were screened and 17 lines

with field tolerance were selected. Selected lines were established in field for further confirmation and trial is in progress.

Fruits

Evaluation and Multiplication of *Annona muricata*

Morphological characterization 180 accessions of Annona and 104 accessions of Mango is in progress. Samples were collected from 28 accessions including selected accession with high Brix values, DNA extraction of these accessions were completed. Propagation of selected plants was started.

Evaluation, characterization and multiplication of exotic Mango germplasm

Morphological characterization was completed. Five exotic accessions were selected as sweet accessions according to Brix values. 100 new plants were produced.

Rice (NCRVT)

National coordinated rice varietal trials of 3 months and 3½ months age groups were tested in 2016/17 Maha and 2017 Yala seasons.

DEVELOPMENT PROGRAMS

Fruits

1.5 ha of fruit garden consisting of underutilized fruits was established. 37 fruit crop species were established.

Infrastructure development activities

During the period under review the store office building renovation was started. Work is in

progress. A seed extraction and post harvest processes building was established, drainage system of the office premises were developed during the year.

Technology Dissemination

Three awareness programs were conducted and more than 105 school children and 12 farmers' fields were visited to solve their field problems. Officers participated at crop clinics organized by the Mahaweli Authority.

Seed and planting material

Production

Following quantities of planting materials were produced and distributed among farmers

and Mahaweli Authority under National Food Production program during the period under review.

PLAN FOR 2018

- National coordinated variety trials for Mae, Brinjal and Pumpkin
- National coordinated rice variety trails (NCRVT).
- Evaluation of Passion fruit germplasm
- Evaluation of existing fruit crop germplasm
- Development of 'Elabatu' varieties
- Development of Okra inbred lines
- NCVT and VAT trials (Vegetable / OFC)
- Breeder seed production program.

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	06	01
Research Assistant (Supra)	01	-
Agriculture Instructor	05	01
Research Assistant	04	05
Technological Assistant	03	03
Farm Clerk	01	01
Driver	01	01
Tractor Operator	02	02
Storeman	01	01
Welder	01	01
Budder	-	01
Research Sub Assistant	02	02
Watcher	07	05
Unskilled Laborer (Grade III)	47	46
Laborer (Contract)	-	12
Total	82	83

1.3 FRUIT RESEARCH AND DEVELOPMENT INSTITUTE (FRDI) – HORANA

Fruit Research and Development Institute (FRDI), Horana and its satellite stations are responsible to develop technologies for enhancing the productivity and quality of fruit crops and primary dissemination of the same to its stake holders. The present research programs are focused on following thrust areas and those are; development of varieties with high yield and better quality, improved crop management practices, crop protection, nutrition management, post harvest processing and value addition and plant propagation techniques. In addition, the institute is responsible for producing planting material of recommended fruit crop varieties especially as

mother plants. Establishment of fruit villages and development of bio-diversity gardens are major development programs that are being implemented under this institute.

FRDI system comprises the main research institute at Horana, Fruit Crop Research and Development Center (FCRDS) at Gannoruwa, Plant Virus Indexing Center (PVIC) at Homagama, Agriculture Research Station (ARS) at Maduruketiya, Agriculture Research Station (ARS) at Muthukandiya, Citrus Research Station, Bibile, and Rambutan Research Unit at Eraminigolla, National Fruit Variety Conservation Centre, Kundasale and Horticulture Research Farm at Ambathenna.

BUDGET

Table 1.3.1: Annual budget – 2017 (Without Horticulture Research Farms Eraminigolla and Ambathenna)

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	15,819,743	14,552,557	92
Capital	7,526,360	7,105,177	94
Projects			
• NARP (FR-FRI-285-2-2-5-2502)			
○ Development of Passion fruit varieties through hybridization and composite seed production	892,800	828,946	93
○ Improvement of yield and quality of Banana (Musa Spp.) var. Millewa Suwandel by some management practices	1,291,600	1,235,352	96
○ Development of high quality Citrus varieties (Sweet Orange and Mandarin) varieties	1,656,000	1,584,852	96

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
○ Characterization of flowering behavior and floral biology of Beli (<i>Aegle marmelos</i>), Wax apple (<i>Syzygium samarangense</i>), Ceylon olive (<i>Elaeocarpus serratus</i>), Soursop (<i>Annona muricata</i>), Sapodilla (<i>Manilkara zapota</i>) for improvement of productivity and quality.	1,368,500	1,397,264	102
○ Regulation of fruit set and post-harvest life and investigation of the variability of bioactive compounds in selected accessions of <i>Annona muricata</i> L. accessions found in Sri Lanka.	1,170,000	1,000,507	86
○ Management of white root disease through integrated approaches	100,000	99,417	99
● Development of open pollinated and hybrid varieties and seed production (Fruit crops) (FR-FRI-285-2-2-8-2502)	5,700,000	4,956,746	87
● National Food Production program – Research projects (118-2-3-20-2502 (II))			
○ Development of package of practices for minimizing post harvest losses of selected fruit crops	800,000	807,052	101
○ Development of <i>in vitro</i> techniques for healthy planting material production of Mandarin	700,000	671,983	96
○ Enhancement of the productivity of fruit crops by managing major pest problems	375,000	283,056	75
● Development of control measures for commonly found post harvest fruit rot diseases of Avocado and Annona	500,000	385,751	77
● Fruit Village development project (Vote No. 285-2-2-9-2502)	15,000,000	14,991,630	100
● Bio diversity project (Vote No. 285-2-2-10-2502)	25,000,000	20,905,692	84
Total	77,900,003	70,805,982	91

PROGRESS

CROP IMPROVEMENT

Mango

Evaluation of newly developed 21 hybrids and previously developed 07 hybrids are being continued. In addition, out of 141 Mango accessions established at FRDI field, yield and fruit quality data were collected from 91 accessions. Among the 11 promising accessions, one accession with regular bearing and high quality fruits was recommended for cultivation in Low Country Wet Zone as 'Horana Hiru'.

Durian

Two new accessions were collected and established in the gene bank and characterization and evaluation of previously collected 36 accessions are being continued.

New 150 hybrids were developed using parents with special characters such as small seeds, high yield and more flesh. One thousand sixty F₁ hybrids previously developed are being evaluated in the field. Data collection pertaining to their performance is in progress.

Citrus

Collection of local germplasm and evaluating these in field gene bank are continuing with the objective of identifying high yielding and good quality Mandarin, Orange, Pummelo and Lime varieties. Ten new lime germplasm and four new Mandarin germplasm were collected and established in the gene bank of FRDI during the year. Promising accessions selected from gene bank was established as a replicated trial for further evaluation. One selected Mandarin variety was released as "Horana

Juicy" for cultivation in Low Country Wet Zone.

Crosses were done among the selected parents of Sweet Orange, Pummelo and Mandarin to develop hybrids and 200 hybrid plants of Mandarin were established in the field for evaluation. Hybrid plants of Sweet orange and Pummelo are in nursery stage.

Plants exposed to gamma irradiation with the intension of development of good quality, high yielding, seed less or lesser seed mutants of Citrus are being continuously evaluated for fruit and plant characters.

Papaya

Breeders' seeds of parents of Horana papaya hybrid -1 (Rathna 2.8 kg and Cp-13 300 g) and hybrid seeds (2.7 kg) were produced at FRDI Horana during 2017 and certified by SCS. Seed production plots were also established in Mahagama farm under Sri Lanka Mahaweli Authority and government seed farm, Bata atha.

One new Papaya line and three previously identified lines of Papaya were advanced up to third selfing generation to develop inbred lines.

Passion fruit

High yielding composite passion fruit variety with larger fruits, high juice recovery and content and quality was released as "Gold Passion" for commercial cultivation. Possibility of seed propagation is an added advantage of the variety. Planting material production of five selected high yielding varietal hybrids with field resistance to Passion fruit mottle virus was carried out. Heritability

studies of self-compatibility of Passion fruit are being continued.

Jack Fruit

Twenty six accessions are being evaluated and among those, two promising accessions were identified and established in two locations for further evaluation.

Bael Fruit (*Aegle marmelos*)

Collection and evaluation of Bael fruit accessions is being continued. Out of 36 accessions evaluated, two promising accessions were identified. Five hundred grafted plants were produced from these two accessions and distributed to selected farmers for confirmation of their superiority. Floral biology and flowering behavior studies were completed and final results were published in ASDA 2017.

Annona

Thirty three accessions (Sour soup 19, Weli anona 09, Seeni anoda 03, Rolinia 02) were collected and established in the field. Collection and evaluation are being continued.

Other fruits and Nut crops

Floral morphology, floral biology, pollination behavior, stigma receptivity and pollen viability studies were conducted for Annona, Sapota and Veralu. Flowering behavior with related to the weather parameters were studied throughout the year for all three crops. Studies are being continued for confirmation of the results.

Inter-species hybridization of the genus *Passiflora*, genus *Annona* and genus *Ananas* are being continued. Flowering has been

observed in 12 hybrids of Pineapple. A cross between *Passiflora miniata* and *Passiflora edulis flavicarpa* was succeeded and fruit setting was successful.

Beli, Mangosteen and Sapota seeds were exposed to Gamma irradiation to get favorable mutants and evaluation of newly developed mutants are in progress.

Germplasm collection program was initiated to collect locally available potential nut crops i.e. Almond (*Prunus dulcis* (Mill)), Wal del (*Artocarpus nobilis*) Kos Del (*Artocarpus camansi*) to identify suitable crops or varieties for using as a nut. Fourteen different accessions from different crops were collected and grafted for further evaluation. However, grafted plants showed slow growth and incompatibility reaction with rootstock. Therefore, studies on grafting techniques of above crops were initiated.

Introduced accessions of new tropical fruit crop Salak or Snake fruit (*Salacca zalacca*) are being evaluated to ascertain the suitability under local conditions. Flowering and fruit formation were observed in few accessions and data collecting is being continued.

AGRONOMY

Several experiments were conducted to improve the yield and quality of Banana, *Musa* spp. Var. Millewa Suwandel by some specific management practices such as de-handing, application of growth stimulants and correct stage of harvesting. Results confirmed that the best time for harvesting of 'Millewa Suwandel' is 15th and 16th weeks from shooting for the first and second crop. Application of one leaf of *Kalanchoe pinnata* in between each hand gave higher yield with

good quality Banana. Application of *Kalanchoe pinnata* with de-handing is also increased the size of fingers.

An experiment was conducted to study the effect of stem diameter of root stock and maturity status of scion on success of wedge grafting of Annona (*Annona muricata* L). Results revealed that grafting of scion wood with young flush with half leaves, mature twig with half leaves or mature twig with no leaves (removing all leaves) to rootstocks of 2 - 4 mm or 5 - 7 mm stem diameter can be successfully used for producing planting material.

An experiment was initiated to study the effect of different spacing of Annona (*Annona muricata* L) on yield and quality and trial is being continued.

Studies of Mango on canopy management, high density planting and use of PGR were initiated and are being continued.

Studies were conducted to identify possibility of using crown as a planting material of Pineapple. Crown plants became similar size to root and axil suckers after six months period with four times of foliar fertilizer application, up to two months after planting. Fruit characters and quality parameters were similar in all three types.

CROP PROTECTION

Plant Pathology

Studies were conducted to manage root diseases of perennial fruit trees through integrated approaches. Colony morphological and growth characters were identified under different media, different temperature levels, pH levels and light intensities and best micro environmental conditions were selected for

root and collar rot causing pathogens (*Rigidoporus microporus*, *Fusarium solani* and *Fusarium oxysporum*) of Jak fruit trees. Suitable antagonists to control the pathogens were selected by dual culturing *in vitro* and by burying root pieces with artificially inoculated pathogens in potting conditions *in vivo*. Optimum preliminary inoculation potting mixture for *Trichoderma* species was selected. Best systemic fungicide was selected to control the pathogens by *in vitro* studies and soil fungicide screening test (SFST). Cross infection abilities of pathogens were observed. Development of Panama tolerant/ resistant Banana mutants through tissue culture method was initiated and irradiated 'Rathambala' tissue cultured plants have been established in sick plot of *Fusarium oxysporum cubensis* and observations are being continued.

Studies were started to develop control measures of commonly found post harvest fruit rot diseases of Avocado and Annona. Three pathogens were identified as causal agents for fruit rot diseases, associated with above crops. Two safe compounds have been selected to control pathogens *in vitro*. The research is ongoing for *in vivo* studies along with field evaluation of selected compounds and selected biological agents.

Dying of Mango trees were reported in North Western and North Central Province. The causal organism was identified as *Botryodiplodia theobromae* and recommendations were given to control the disease.

Entomology

All recommended varieties of *Psidium guajava* are susceptible to root knot nematodes. In

previous studies a resistant rootstock was identified and subsequently, it was grafted with Guava plants of all recommended varieties and planted in the field for further evaluation against root knot nematode. The culture of *Trichoderma* was prepared for testing with poultry manure to control root knot nematode in Guava. Root knot nematode culture collected from Kalpitiya is maintained to confirm the species identification by molecular methods.

Spot application of protein bait can be replaced by the trap loaded with 5 ml of undiluted protein bait mixed with Spinosad at 0.025 g/l in the area wide IPM of fruit flies. Through this approach, the cost of application can be reduced by 50 %.

Existing insect proof net house was repaired to facilitate the rearing of fruit flies and parasitoid of papaya mealy bug. Lab experiments were initiated on rearing of fruit flies. White colour bags are suitable for covering of Guava fruits for prevention of pests (fruit fly & mosquito bug).

SOIL AND NUTRIENT MANAGEMENT

A research study was initiated to develop plant test based fertilizer techniques for fruit crops and studies were started to analyze critical leaf nitrogen levels of Papaya.

An experiment was started to identify the effective level of Calcium and rate of Calcium to control yellow sap disorder and translucent disorder.

FOOD SCIENCE AND TECHNOLOGY

Experiments are being conducted for development of a package to minimize postharvest losses of selected fruit crops. Foliar Calcium was sprayed at 3 different stages of Pineapple flower to minimize internal browning of Pineapple. Internal browning and translucency symptoms were not observed in all calcium treated fruits compared to control

An experiment conducted to identify correct harvesting stage of Guava revealed that green yellow stage is the best, according to the physical and chemical parameters tested.

An experiment was conducted to identify the maturity indices of Annona. All 3 accessions tested showed double sigmoid growth pattern. Days to maturity varies from 4½ to 8 months within an accession. Changes of weather pattern during the aforesaid time period do not correlate with the growth pattern. Due to these reasons days after anthesis cannot be considered as a harvesting index. During the growth period fruit skin color varies with five distinct green shades. Number of spikes on square inch of fruit skin also changes with the growth of fruit and at maturity stage same number of spikes occur in a square inch in one variety. As non-destructive indices fruit skin color and number of spikes in fruit surface can be successfully used as maturity indices.

Shelf life of Passion fruit (*Passiflora eludis*) can be increased up to three weeks by packing in low density polyethylene (LDPE). Research is ongoing for further refinements.

Optimum level of Jak fruit flakes for production of a vegetable finger with sprouted Mung bean, mushroom, rice flour, spices, solid fat and salt was identified and further studies

with analysis of protein content, storage time and conditions and microbial analysis are in progress.

BIOTECHNOLOGY

Banana var. Millewa Suwandel culture establishment with high survival rate was obtained with the incorporation of Silver nitrate, Gentamicin and Amoxilin 100 mg/l Gentamicin or Rifampicin 150 mg/l into the media. Multiplication was observed in the MS media supplemented with 1mg/l TDZ at the rate of six shoots per subculture.

Gannoruwa Red is a recently introduced red banana variety and the demand is very high for the healthy planting materials. Therefore *in vitro* planting material production was started and nearly 400 plantlets are at the rooting stage at present.

In vitro shoot grafting of Mandarin showed 30% success rate and observed very poor feeder root development in grafted plantlets. Only 40% of grafted plants were survived in the process of acclimatization.

Two types of ‘Masan’ were tested for shoot multiplication and the research is being continued. Wild types were responded for *in vitro* multiplication compared to recommended variety.

Seedless Guava accession was collected and layered plants were evaluated at the field with available Guava varieties for yield and quality parameters. Experiments are continued for *in vitro* shoot multiplication and rooted micro cutting production.

FRUIT DEVELOPMENT

ACTIVITIES

Fruit Village Development Project

(Vote No. FR-285-2-2-9-2502)

Main functions of the project are establishment of fruit villages in different areas of the country, establishment of mother plant orchards and production of planting material at research farms to cater the requirements of fruit villages and promoting fruit consumption through school awareness programs. During the year, 79,000 fruit planting materials were produced. Thirty nine fruit villages were established with different crops. The mother plant orchards of Agriculture Research Stations Maduruketiya, Muthukandiyā, Bibila, Agunakolapelessa and Gannoruwa were expanded and maintained. Entrepreneurs were trained and contributed to establish 08 fruit sales outlets in schools of the Gampaha District and one in the Base Hospital, Horana with the objective of reducing the starch consumption of school children during the school hours and improve their interest on healthy foods. Two hundred grams of local fresh cut fruits and 300 ml of a fruit juice were sold at Rs. 25/= each.

Table 1.3.2: Planting material produced under fruit village program

Crop	Number of plants
Pomegranate	12,000
Sweet Orange	15,000
Wood Apple	5,000
Mandarin	3,000
Soursop	40,000
Lime	4,000

Table 1.3.3: Establishment of new fruit villages and maintenance of established fruit villages

Type of Fruit village	Number of villages	Established District
Pomegranate	03	Hambantota, Polonnaruwa, Ampara
Sweet Orange	06	Anuradhapura, Kurunegala, Hambantota, Batticaloa, Monaragala
Wood Apple	02	Ampara, Monaragala
Mango	04	Matale, Hambantota, Polonnaruwa, Ampara
Soursop	14	Matale, Rathnapura, Gampaha, Kandy, Batticaloa, Ampara
Durian	04	Matale, Rathnapura, Gampaha, Kandy
Rambutan	01	Rathnapura
Lime	02	Anuradhapura, Kurunegala
Guava	01	Hambantota
Passion fruit	01	Gampaha
Banana	01	Kandy

Bio Diversity Fruit Garden project (Vote 285-FR-FRI-2-2-10-2502)

This project aimed at establishment of new fruit orchards, maintenance of already established fruit orchards and development of infrastructure facilities of the Institute. Mother plant fruit orchard of underutilized fruits, Durian and Banana was established in an extent of 1 ha in 2017 which aims to strengthen the planting material production program. Already established fruit orchards of 32 ha were maintained during the year. Construction of the field training center was completed and furniture was purchased for training center and field training center. 1.5 km length of road development was completed. Repairing of an existing old building as stores was completed and irrigation facilities were developed for 1 ha of land. Maintenance of mother plant orchards, establishment of new fruit orchards and development of infrastructure facilities of national variety

conservation center at Kundasale and Biodiversity garden in Diyagama sports ground were also carried out under this project.

TECNOLOGY TRANSFER AND SERVICES

Training and awareness programs

Forty six training programs were conducted on fruit cultivation, pests and diseases of fruit crops, bio technology (Tissue Culture), nursery management for 1,429 participants, comprising of agriculture officers, farmers and entrepreneurs, teachers, university students and Agriculture Diploma students. Job training programs were conducted for 32 Agriculture Diploma students and university students. As resources persons 21 scientists were involved in-service training programs.

A total of 2,518 individuals visited the institute to acquire knowledge on fruit cultivation. Two university students completed their research

projects and 18 HND students completed their industrial training in the Institute.

Mass Media Program

Twenty six radio programs (Govi gedara, Govisara, Govijana madala, Govithenata peyak, Sara bhumi and Seilama) and 8 TV programs (Shraddha channel) were broadcasted on fruit crop cultivation, Pest and disease management, tissue culture and food processing with the participation of FRDI scientists during the year 2017.

Services

Field investigations, sample collection, disease and pest diagnosis and giving recommendations were done and during the year 68 samples were diagnosed and recommendations were given for farmers.

Seven hundred and eighty one soil samples were analyzed.

More than 1,800 farmers were advised on fruit cultivation.

Planting Material Production

During the year 2017, the Institute sold 25,360 budded plants, 584 layered plants and 10,467 seedling plants of Rambutan, Durian, Beli, Sapota, Mango, Veralu, Jack fruit, Jambu, Star fruit, Mangosteen, Annona, Guava, Mandarin, Chempadak, Gaduguda, Citrus, Lovi and other underutilized fruit crops. Nine hundred and thirty five Pineapple and 750 Banana suckers were also sold. The institute earned a total sum of Rs 3,860,435 by selling planting materials.

PLAN FOR 2018

Crop Improvement

- Development of good quality high yielding cultivars of Mango for different Agro Ecological Zones.
- Development of hybrids of Mango with high yield and good quality.
- Collection, evaluation and selection of high yielding good quality Durian varieties for commercial cultivation.
- Development of high yielding good quality Durian varieties through hybridization.
- Development of high yielding good quality Citrus (Orange and Mandarin) varieties through hybridization.
- Collection, evaluation and selection of high yielding good quality Citrus varieties for commercial cultivation.
- Development of good quality, high yielding seedless/ less seed Citrus mutants (Nasnaran, HOOCR 24).
- Development of high yielding, good quality Papaya hybrids/varieties.
- Seed production of Horana Papaya Hybrid-1.
- Development of yellow Passion fruit (*Passiflora edulis f. flavicarpa*) varieties through hybridization and varietal selection.
- Development of high yielding, good quality Jack fruit varieties.
- Studying inheritance of self-compatibility and passion fruit mottle virus resistance.
- Collection, evaluation, characterization and selection of 'Beli' germplasm.
- Study the floral biology and flowering behaviour of 'Beli'.

- Characterization of flowering behavior & floral biology of 'Beli', Wax apple, Ceylon Olive, Sour sop and Sapodilla for improvement of productivity and quality.
- Development of *Annona* varieties with high yield and good quality.
- Development of seedless Guava variety.
- Development of new hybrids through interspecific hybridization in family Passifloraceae, Annonaceae and Bromeliaceae.
- Collection, evaluation and selection of 'Gaduguda' for high yield and quality.
- Development of *Annona* varieties (Soursop, Custard Apple, Sugar Apple etc.) with high yield and good quality.
- Development of high yielding good quality fruit varieties (Mangoosteen, Beli, Sapota) through mutation.
- Identification and selection of potential crops/ varieties (Almond, Wal Del and Kos del) for nut purpose.
- Evaluation of Salak/ Snake fruit (*Salacca zalacca*) varieties.
- Exploration, collection and evaluation of Bread fruit accessions.

Agronomy

- Study the effect of different concentrations of Paclobutrazol and KNO₃ to for flower induction of Mango under Wet Zone condition.
- Productivity increase of Mango by canopy management using different training & pruning techniques.
- Development of canopy management practices to increase yield and quality of (*Annona muricata* L).

- Development of canopy management practices on yield and quality of Guava (*Psidium guajava* L.).
- Field evaluation of recommended Guava varieties grafted on resistant root stock to root knot nematode.
- Effect of crown size on yield and quality of Pineapple fruit.
- Effect of different spacing on yield and quality of Pineapple fruit.
- Effect of plant hormone for induction of seedless fruits of *Annona muricata*

Soil and nutrient management

- Identification of green technological soil fertility management package for Pineapple.
- Identification of agronomic practices to control yellow sap disorder and translucent disorder in Mangosteen.
- Identification of critical leaf Nitrogen level for Papaya to mitigate climate change impact.
- Effect of time and rate of application of Calcium on yellow sap disorder and translucent disorder of Mangosteen.
- Nutrient status of the soil in research fields of Fruit Research and Development Institute.
- Identification of plant nutrient management practices to quality and productivity of Water melon.

Plant Pathology

- Development of Panama disease tolerant/ resistant Banana mutants through tissue culture.
- Management of root diseases of perennial fruit trees through integrated approaches.

- Testing of non-chemical methods to control of anthracnose disease of Mango.
- Management of Guava wilt disease through biological control agents.

Entomology

- Studies on Biology and management of root knot nematode (*Meloidogyne* spp.) of Guava (*Psidium guajava*) in major growing areas of Sri Lanka.
- Identification and management of shot hole borer species in fruit crops (Annona, Mango, Rambutan etc.)
- Management of white waxy scale in Mango by integrated approach.
- Mass Culturing of fruit fly (*Bactrocera dorsalis*) using low cost techniques to Increase mating success for SIT applications (Project proposal submitted to IAEA).
- Identification of pests of Bread fruit.

Food Science

- Analysis of physio-chemical properties, microbial population and evaluation of storage conditions of prepared 'Vege finger' from jackfruit.
- Development of package to minimize postharvest losses of selected fruit crops (Pineapple, Guava, Avocado).
- Identification of nutritional composition and chemical compounds of selected underutilized fruit crops.
- Identification and quantification available antioxidants in *Annona muricata*.

Biotechnology

- Micro propagation of DOA recommended Banana var. Millewa Suwandel.

- Micro propagation of Mandarin.
- Micro propagation of underutilized fruit crops (Masan).

Development

- Development of Fruit villages.
- Production of tissue culture planting materials of Banana.
- Production of planting material of fruit crops.

Technology Transfer and Training

- Training of extension officers and farmers on new technologies.
- Advisory services for growers on fruit cultivation.

AGRICULTURE RESEARCH STATION – MADURUKETIYA

Agriculture Research Station, Maduruketiya undertakes research and development activities to enhance the production and productivity of fruit crops and gives a special emphasis on the crops adapted to the Low Country Intermediate Zone (LCIZ) and Low Country Dry Zone (LCDZ). It serves the community by conducting training programs for officers, students, students, farmers and other stakeholders on fruit crop cultivation and management. The division of plant propagation and nursery management annually produces considerable amount of planting materials for various research and development projects.

PROGRESS

Conducted National Coordinated Variety Trials for Mango, Finger millet, Chili, Groundnut, Cowpea and Pumpkin and data were submitted to relevant officers.

DEVELOPMENT

Training programs

Two training programs were conducted for officers and farmers on propagation techniques and fruit crop management. One university students completed her research projects and 2 Diploma students and 4 Technical College students completed their industrial training in the station. Advices were given for 20 farmers on fruit cultivation

Planting Material Production

Table 1.3.4: Planting material production during 2017

Crop	General sale	Fruit village
Sweet Orange		
budded	134	7,750
Wood apple		
budded	160	840
Mandarin budded	106	-
Passion fruit stem		
cuttings	3,289	-
Sour sop		
seedlings	380	-
Other	388	-

CITRUS RESEARCH STATION - BIBILE

Citrus Research Station, Bibile is situated in Low Country Intermediate Zone (LCIZ) and mainly designated to conduct research and development activities of Citrus. Citrus germplasm garden with all recommended varieties and selections are being maintained. The unit has a fruit nursery which produces planting materials especially Sweet Orange and Mandarin.

Planting Material Production

Table 1.3.5: Planting material production during 2017

Crop	General sale	Fruit village
Sweet Orange		
(Budded)	940	11,560
Rambutan		
(Budded)	200	1,500
Lime	300	5,000
Passion fruit		
stem cuttings	1,500	-

AGRICULTURE RESEARCH STATION, MUTUKANDIYA

Agriculture Research Station, Mutukandiya is situated in Low Country Dry Zone (LCDZ) and mainly designated to conduct research and development activities. Germplasm of Citrus and other crops are being maintained in the research station. The unit has a fruit nursery which produces planting materials especially Wood apple.

Planting Material Production

Table 1.3.6: Planting material production during 2017

Crop	General sale	Fruit village
Wood apple (Budded)	-	3,100
Sweet Orange (Budded)	89	-
Soursop	200	-
Other	2,750	-

- Study the effect of different rootstocks on grafted *Citrus sinensis* for improving the productivity in LCDZ/ LCIZ.
- Study of different management practices for off season yield enhancement of Lime.
- Study the growth pattern and performances of Passion fruit varieties for commercial cultivation in LCIZ.
- Evaluation of Guava accessions for yield and quality.

PLAN FOR 2018

Research

- Exploration, collection and evaluation of Citrus germplasm.

Development

- Planting material production of fruit crops.
- Training of farmers on fruit cultivation and advisory services.

STAFF LIST

FRDI, Horana

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	01
Principal Agriculture Scientist	05	01
Deputy Director of Agriculture	01	01
Assistant Director of Agriculture (Research)	18	09
Assistant Director of Agriculture (Development)	03	02
Assistant Director of Agriculture (Economics)	01	01
Administrative Officer	01	01
Economist Assistant	01	01
Program Assistant (Agriculture)	09	03
Development Officer	05	01
Agriculture Instructor	07	16
Research Assistant	35	19
Engineering Assistant	01	-
Public Management Assistant	10	10
Technological Assistant (Engineering)	01	01
Technological Assistant (Extension)	03	06
Farm Clerk	01	01

Designation	No. Approved	No. Existing
Driver	06	07
Tractor Operator	02	02
Storeman	01	-
Mechanic	01	-
Carpenter	01	-
Mason	01	-
Electrician	01	-
Technician	01	-
Research Sub Assistant	04	-
Budder	03	03
Office Employee	01	-
Watcher	08	07
Laborer (Permanent)	111	82
Laborer (Contract)	62	44
Laborer (Contract) - NARP Projects	18	18
Total	325	238

ARS, Maduruketiya

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	-
Assistant Director of Agriculture (Research)	04	01
Research Assistant (Special Grade)	01	-
Development Officer	01	-
Agriculture Instructor	02	01
Research Assistant	02	01
Public Management Assistant	02	-
Technological Assistant	0	04
Farm Clerk	01	01
Driver	01	01
Tractor Operator	01	02
Research Sub Assistant	01	-
Budder	01	01
Watcher	04	05
Laborer	26	21
Laborer (Contract)	09	09
Total	57	47

Citrus Research Station, Bibile

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	01	-
Research Assistant (Special Grade)	01	-
Development Officer	01	-
Agriculture Instructor	01	-
Research Assistant	-	01
Technological Assistant	-	01
Farm Clerk	01	-
Driver	01	-
Budder	01	02
Watcher	03	04
Laborer	11	20
Laborer (Contract)	12	08
Total	33	36

ARS, Muthukandiya

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	01	-
Development Officer	01	-
Agriculture Instructor	01	01
Research Assistant	01	-
Watcher	03	03
Laborer	15	09
Laborer (Contract)	10	10
Total	32	23

1.3.1 FRUIT CROP RESEARCH AND DEVELOPMENT STATION (FCRDS) – GANNORUWA

Fruit Crop Research and Development Station, Gannoruwa undertakes research, development and extension activities to enhance the production and productivity of fruit crops and playing a pioneering role in popularizing underutilized fruit crops and container planting of fruit crops. Landscaping using fruit plants (edible landscaping) is also given a high priority under these programs. Furthermore, it plays a role in technology transfer and knowledge dissemination through conducting

training programs for officers, students of the universities, higher diploma students and schools etc., farmers and other stakeholders on fruit crop cultivation and management. The division of plant propagation and nursery management produces large number of planting materials including underutilized fruit crops for various research and development projects and for the SPMDC and provide a considerable fraction of the national requirement.

BUDGET

Table 1.3.1.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
FCRDS, Gannoruwa			
Recurrent	3,961,000	4,409,855	111
Capital	1,300,000	1,087,852	84
Projects			
• Fruit village development			
o Maintenance of established demonstration and research Fruit Orchard	500,000	485,355	97
• Special plant breeding project			
o Development of Longan varieties	700,000.	689,808	99
• NARP			
o Development of Avocado	391,200	360,000	92
• National food production program			
o Effect of climatic factors on fruit crops	1,000,000	987,844	99
Total	7,852,200	8,020,714	102

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Rambutan Research Unit, Eraminigolla			
Recurrent	120,000	128,489	107
Capital	450,000	450,000	100
Projects			
• Fruit village development			
o Production of Soursop planting materials	500,000	500,000	100
Total	1,070,000	1,078,489	101
Horticulture Research Farm, Ambatenna			
Recurrent	944,239	949,255	101
Capital	550,000	538,477	98
Projects			
• Fruit village development			
Total	1,994,239	1,991,696	100

PROGRESS

RESEARCH

Fruit Breeding - Major Fruits

Banana

One 'Embul' Banana accession which showed high quality characters was identified. However, yield is lower compared to the recommended variety 'Nadee'. In addition, promising lines of 'Emban kesel' and Ash plantain were evaluated and the activity is being continued. Furthermore, a planting material production block was established to produce planting materials of newly released 'Gannoruwa Seeni 1' variety.

Papaya

Promising Papaya lines were developed through cyclic selection and selfing/ sib mating. Two lines which showed high yield, good quality characters were identified for further selection and evaluation is being

continued with the aim of development of inbred lines.

Guava

A promising accession which gives high yield with good quality fruits was identified. 50 plants of the above accession were established in the field for further evaluation.

Citrus

A promising Orange accession which gives high yield with good quality fruit was identified and planting material production is being continued for further evaluation.

Avocado

Fifteen accessions were collected from farmer's fields during the year. Previously collected 10 accessions were established in the gene bank with recommended varieties.

Durian

Evaluation of 7 new accessions is in progress.

Underutilized Fruit Crops

Evaluations of underutilized fruit crops are being continued in the field gene banks, research fields and in containers.

Aonla

High quality larger fruit size producing accession that was identified from Kurunegala, Wellawa area was released as Gannoruwa Amla (Rohana).

Jamun

Two accessions were released as Gannoruwa Jamun (Purple big) and 'Gannoruwa eladan' (Hingurakgoda). Those were collected from Gannoruwa and Hingurakgoda respectively.

Longan

One exotic accession was collected which is considered to be producing large, fleshy fruits. In addition, mutated lines are maintained for further evaluation.

Ceylon Gooseberry

Two accessions were collected and identified as a new potential fruit crop. The Ceylon gooseberry is a plant native to Sri Lanka and there is potential to develop it as a high valued fruit crop.

Brazilian Cherry

One promising accession, producing sweet taste fruits was identified.

Lolu

Identified one promising accession with large fruits compared to local Lolu plants.

Identification of new fruit crops

The exotic fruit crop known as Nanche (*Byrsonima crassifolia*), Golden spoon was identified as a potential fruit crop that is used in other countries in many ways.

Agronomy

Effect of Climate change

196 data sheets were received from 5 Agriculture Instructor ranges and project is continuing.

A research related to planting material production and to develop new technologies to enhance the planting material production of underutilized fruit species are continuing. Priority has been given to highly demanded under-utilized fruit species i.e. Bale fruit, Ber, Longan, Aonla, Bignay, Soursop and Ceylon olive etc.

Soursop

Budding and grafting methods were tested repeatedly to identify the most suitable budding method compared to wedge grafting in Soursop planting material production. Field evaluations are being continued. It was observed that bud grafting was promising compared to wedge grafting.

Ceylon Olive

A comprehensive technology was developed to decompose and split the hard seed coat of Ceylon olive seeds and to produce seedlings that are suitable for grafting in a shorter time period.

DEVELOPMENT

Training programs

Training programs were conducted on pruning of fruit crops, nursery management, plant propagation techniques with the emphasis on budding, grafting, seed germination and techniques of container planting and root-balling. Officers of the FCRDS participated as resources persons in training programs held at ISTI, Gannoruwa and at other venues.

- Farmer training programs - 07 (No. of farmers - 325)
- Officer training programs - 04 (No. of Officers - 175)
- University/ Diploma/ other student's programs - 26(No. of students – 1,270)

Students' Projects

Assisting university students during their research programs is being done every year. During this year, one undergraduate student completed her final year research project under our supervision.

Extension activities

During the year officers of FCRDS participated in 6 radio programs which were broadcasted through, different radio channels. Instructions on fruit cultivation, management and pest & disease management were given for about 180 fruit growers who visited the station or made requests through telephone.

Planting Material Production

Plant Propagation and Nursery Management Division in collaboration with the Research Division was able to produce planting materials under SPMDC, fruit village development and food production projects.

Table 1.3.1.2: Planting material production (SPMDC) during 2017

Type of plant	No. of plants produced
Sapota - Grafted	130
Durian - Grafted	1,000
Jack Fruit - Grafted	1,796
Carambola - Grafted	2,600
Butter fruit - Grafted	187
Uguressa - Grafted	686
Weralu - Grafted	250
Bael fruit - Grafted	500
Other - Grafted	1,500
Mango - Grafted	320
Soursop - Grafted	750
Longan - Grafted	200
Bignay - Grafted	350
Other - Grafted	600
Soursop seedlings	3,600
Longan seedlings	3,300
Other seedlings	8,668
Total	26,437

RAMBUTAN RESEARCH UNIT - ERAMINIGOLLA

Rambutan Research unit is situated in Kegalle District which is mainly designated to conduct research and development activities related to Rambutan. Most of the area of the unit is covered with Rambutan plantations. In addition mother plants of recommended Jack fruit varieties are also established. The unit has a fruit nursery which produces planting materials especially, Rambutan, Jack fruit and Ber.

PROGRESS

Planting Material Production

Fruit nursery of the unit produced following planting materials under fruit village project.

Table 1.3.1.3: Planting material production at Rambutan Research Unit 2017

Type of plant	No. of plants produced
Rambutan Grafted plants	1,100
Soursop seedlings	10,000
Total	11,100

HORTICULTURE RESEARCH FARM - AMBATENNA

Horticulture Research Farm, Ambatenna is a small farm with 1.9 ha. in extent and mainly occupied with fruit trees of Rambutan, Durian and Banana. The farm nursery produces planting

material of Durian, Rambutan, Carambola and many other fruit crop spp.

PROGRESS

Planting Material Production

Fruit nursery of the unit produced following planting materials under fruit village project and funds were received from Seed and Planting Material Development Center.

Table 1.3.1.4: Planting material production at HRF, Ambathenna

Type of plants	No. of plants produced
Avocado - Grafted	350
Sapota - Grafted	950
Durian - Grafted	1,500
Jack Fruit - Grafted	550
Carambola - Grafted	1,995
Jambu - Grafted	540
Guava - Grafted	145
Soursop - Grafted	1,450
Ramonchi	25
Other - Grafted	250
Lemon stem cuttings	1,200
Rose apple stem cuttings	575
Guava seedlings	2,000
Soursop seedlings	15,000
Passion fruit	1,050
Lime seedlings	5,500
Dwarf Ambarella seedlings	345
Papaya	890
Vegetable seedling pots	1,121
Other seedlings	510
Total	36,946

Table 1.3.1.5: Planting material production under Fruit Village Program

Type of plants	No. of plants produced
Soursop seedlings	8,000
Mango - Grafted	650
Total	8,650

PLAN FOR 2018

FCRDS, Gannoruwa

Research - Fruit Breeding

- Development of high yielding good quality Papaya varieties.
- Selection of high yielding good quality Citrus varieties for Mid Country Wet Zone.
- Selection of Avocado varieties for Mid Country Wet Zone.
- Selection of high yielding good quality Guava varieties for Mid Country Wet Zone.
- Evaluation of 'Embon' banana accession selected from the germplasm evaluation
- Evaluation of nematode resistant grafted plants of Guava under field condition.
- Evaluation of Durian germplasm to select better accessions for release.
- *Ex situ* evaluation of under-utilized fruit species
- Evaluation of outstanding under-utilized fruit crop accessions. E.g. Bale fruit, Ber, Longan, Jamun, Aonla.
- Development of high yielding good quality Longan varieties through mutation breeding.

Agronomy and Other

- Evaluation of vegetative propagation methods for under-utilized fruit spp. i.e., Ber, Bael fruit, Ceylon olive, Nam nam, Longan and Ceylon Gooseberry etc.
- Evaluation of local fruit spp. in large containers.
- Studying the artificial flower induction in Longan.

- Studies to enhance early seed germination, seedling growth, grafting success of Ber, Soursop, Longan, and Aonla.
- Evaluation of budded and grafted Soursop plants in field condition.
- Continuing the survey on the effect of change in climate on fruit production.
- Studying the effect of vegetative propagation on flowering and fruiting of Nam nam
- Study on finding alternative root stocks for Amla, Longan and Ber

Rambutan Research Unit,

Eraminigolla

- Planting material production of Rambutan and Jak (Waraka)
- Improvement of facilities of the farm.

HRF, Ambatenna

- Planting material production of fruits and other crops
- Establishment of mother plant orchard.
- Improvement of facilities of the farm.

STAFF LIST

FCRDS, Gannoruwa

Designation	No. Existing
Head of the Institute / Assistant	
Director of Agriculture (Agric. Research) In Charge	01
Program Assistant (Agriculture)	01
Development Officer	02
Farm Manager	01
Research Assistant	02
Public Management Assistant	02

Designation	No. Existing
Technological Assistant	04
Farm Clerk	02
Driver	01
Research Sub Assistant	02
Welder	01
Budder	03
Watcher	13
Laborer	47
Laborer (Contract)	23
Total	105

**Rambutan Research Unit,
Eraminigolla**

Designation	No. Existing
Farm Manager	01
Development Officer	01
Agriculture Instructor	01
Budder	01
Watcher	02
Laborer	04
Laborer (Contract)	00
Total	10

1.3.2. PLANT VIRUS INDEXING CENTRE (PVIC) -HOMAGAMA

The Plant Virus Indexing Centre, Homagama functions under the administration of the Director, Fruit Research & Development Institute, (FRDI), Horana. The mandate of the center is application of currently used advanced technologies for plant virus and virus like organism detection, production of test kits for virus and other organism detection in laboratory and field indexing, quarantine purposes epidemiological investigations

evaluation of possible management methods development of virus free basic foundation stocks, investigation of virus coat protein mediated resistance, and detection of other pathogenic organisms (Fungi, Bacterial, Nematodes, Viroids and Phytoplasma). The substation “Eco friendly agriculture technology unit” at Diyagama disseminates technology including a series of activities relevant to research and extension.

BUDGET

1.3.2.1 Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	2,911,170	3,197,700	110
Capital	1,378,000	1,384,346	100
Projects			
• NARP			
○ Development of Pomegranate promising lines through <i>in vitro</i> mutation induction and seed mutation induction using Gamma radiation	327,900	269,634	82
○ Development of technologies for the production of virus free planting material through propagation techniques for selected fruit crops	1,050,000	1,076,880	103
○ Identification and confirmation of phytoplasma disease and their host range in cultivated crops.	1,518,300	1,518,300	100
○ Identification of virus and virus like diseases in Cucurbits, Chilli, and Legumes in Southern Dry Zone region in Sri Lanka	1,000,000	989,137	99
○ Potential use of soil antagonisms for successful management of panama diseases of banana caused by <i>Fusarium oxysporum f.sp.cubense</i>	1,671,700	1,608,418	96
○ Integrated pest management program for controlling of stem bores in Mango and Durian	595,000	458,800	77
○ Optimization of Micro propagation protocol for DOA recommended Banana variety “Agra”	284,000	281,390	99

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Bio-diversity Project			
○ Eco friendly agriculture Technology Unit (Diyagama)	500,000	498,146	100
Total	11,236,070	11,282,751	100

PROGRESS

PLANT VIROLOGY

- Identification and management of virus and virus like diseases in Cucurbits, Legumes and Chilli in Southern Dry Zone region in Sri Lanka was carried out in collaboration with Angunakolapellassa GLORDC. This is a continuation. 'Thumba karawila' was heavily infected with phytoplasma. Further, it was infected with Cucumber green mottle mosaic virus, Papaya ringspot virus and Zuchchini yellow mosaic virus in low percentages. Phytoplasma and begamo virus are the other common viruses in Cucurbits. Bitter gourd was heavily infected with Cucurbit aphid borne yellow mosaic virus.
- Use of ecological engineering concept for the management of viral disease in Chilli was studied. Planting flower borders around the Chilli field and mulching with reflective polythene reduced virus disease incidence in Chilli.
- A study was conducted to find the effectiveness of application of different fertilizers to manage Pineapple wilt virus in Pineapple. It was found that application of baur fertilizer mixture reduced the disease severity of the plants.
- In the routine virus indexing program, around 1,500 plant samples were tested for

different viruses generating income of Rs. 306,600/=

MOLECULAR VIROLOGY

- To prepare a gene construct for the production of transgenic papaya primers were re-designed
- With addition of restriction sites and amplification of desired region of the coat protein gene, of Papaya Ring Spot disease (PRSV) of Sri Lanka was isolated. The amplified product was sent for sequencing and confirmed. Transformation studies are in progress.
- A survey was carried out in 14 districts of Sri Lanka based on 5 crop commodities to identify and confirm phytoplasma disease. It was confirmed that Snake gourd, Okra, Bitter gourd, 'Miniee mal', 'Mayura thana', 'Kapumkeeriya', 'Atora', Orchid, 'Gata thumba', 'Undupilyaliya' and 'Yodha nidikummba' were infected with phytoplasma.
- It was proven that, the phytoplasma disease can transmit through seeds of Bitter gourd, Snake gourd, Ridge gourd and Okra.
- *Fusarium oxysporum* f. sp. *Cubense* samples were collected from different locations of Sri Lanka and identified through molecular methods. Genetic

diversity of *Fusarium oxysporum* f. sp. *Cubense* was identified.

- Sri Lankan and Indian Cassava mosaic viruses were identified by molecular methods and duplex PCR method was developed to identify these two virus diseases simultaneously.
- In the routine virus indexing program, four thousand one hundred and fifty four (4,154) diseases suspected plant samples including vegetable crops, fruit crops, ornamental plants and tuber crops were indexed for viruses. An income of Rs. 1,029,000 was generated.

TISSUE CULTURE

- The multiplication rate of Kolikuttu variety “Agra” is significantly low in the optimized protocol and the protocol needed to be revised. Therefore, an experiment was initiated to overcome above problem and the cultures are in rooting stage at present.
- Plants can be regenerated from available vegetative material through callus culture and this method can be used in mutation breeding programs as a valuable tool. Surface sterilization, establishment and callus induction steps were successfully completed and at present, the experiment is in embryo development stage.
- Fluorescent lamps are most commonly used in tissue culture labs however the electricity consumption is comparatively high. Therefore, it is important to introduce an efficient light source, which not only improves the quality of *in vitro* plants but also minimize per plant

production costs. LED (Light emitting diode) has been proposed as potential alternative light source for growth and development of *in vitro* and greenhouse plants. Therefore, this research was initiated to study the effect of LED on growth and multiplication of TC plantlets. Cultures from different crops are maintained under LED system and experiment is being continued.

DEVELOPMENT PROGRAMS

Planting Material Production of Banana

- To cater the high demand of tissue cultured banana plants a new program was initiated to produce 10,000 disease free plants. In 2017, Nine Thousand nine hundred and fifty (9950) plants were produced and distributed among farmers through Seed & Planting Material Centre (SPMDC).
- Callus induced tissue cultured plants with good quality characters of the imported Pomegranate were selected after field planting. The protocol was developed for nodal culture from selected plants.
- Development of promising Pomegranate lines through *in vitro* mutation induction and seed mutation induction using gamma radiation was carried out. LD 50 value and suitable gamma irradiation dosage for calli and seeds were determined. Gamma treated pomegranate plants were field planted. Field evaluation is ongoing for the determination of different plant characters.

- Production of tissue cultured hybrid papaya planting material using local hybrid seeds was carried out. Surface sterilization and shoot proliferation of shoot tip explant were optimized.
- Development of a protocol for the production of apple planting material using seed culture from imported fruits was carried out. Apple seeds were germinated in MS media. Shoot tips were taken from *in vitro* germinated apple seedlings and multiplication and root formation protocols were developed.
- Production of a new Pineapple variety by using cross pollination was carried out. Pineapple varieties Kew, Mauritius and MG3 were used for cross pollination. Pineapple seeds were collected and cultured *in vitro* in hormone free MS medium for germination. Germinated seedlings were subjected to multiplication, root formation and hardening in MS medium. Hardened Pineapple plants were field planted. Observation and data collection were carried out. Segregated plants were identified and suckers were transplanted for back cross breeding characters.

EPIDEMIOLOGY

- The second year of the project named Development of a protocol for Trunk Injection of pesticides as a part of an integrated pest management program for controlling Stem borers in Mango and Durian was continued in several districts in Wet Zone. It started and continued mainly in Mahayaya Estate belongs to the Kurunegala Plantations Limited. It was

revealed that the problem could be successfully managed with the integrated management. The pest was not successfully controlled solely with stem injection methods. The pest incidences were comparatively low in Gampaha area this year compared to the other years. Awareness programs were conducted for field agricultural officers in Kegalle and Rathnapura districts.

- Assessing the field level distribution pattern of white wax scales and determining the management measures in Mango trees and other fruit crops research was started based on Plant Virus Indexing Centre and Fruit Research and Development Institute. The data was collected from mango trees growing along the roads. It was found out that the pest incidences are higher in trees in town or urban areas compared to the country sides. The severity is higher when crops are stressed with moisture and nutrient stresses. It was also higher in dusty environments too. The pest incidences were higher in variety 'Peterprasand' and very low in 'Gira amba'.

MICROBIOLOGY

- Investigation on induced defense enzyme by application of Plant Growth Promoting Rhizobacteria (PGPR) against PRSV in papaya was carried out. It was found that several rhizobacterial isolates of *Pseudomonas* and *Bacillus* spp., have the ability to enhance the activity of defense-related enzymes. This will be continued.
- A field trial was carried out to find the field level efficacy of identified five

Pseudomonas fluorescence isolates to manage chilli viruses. It was a failure due to heavy bacterial wilt infection

- Identification of potential antagonistic bacteria for successful management of panama disease in Banana caused by *Fusarium oxysporium* sp. *Cubense* was carried out. Five potential bacterial isolates were identified by invitro test. Pot trial was started.
- A study was conducted to find the efficacy of the use of plant antiviral compounds to manage papaya ringspot virus in Papaya. *Boerhaavia diffusa* root extract and *Clerodendrum aculatum* leaf extract was found effective in reducing PRSV symptoms
- In routine indexing program, around 200 disease samples were tested to identify causal agents and recommendations were given.

TECHNOLOGY TRANSFER

- 28 training programs and two field days were conducted at the PVIC for entrepreneurs, Agriculture Instructors, teachers, Government officers, NVQ students University students and school children with a total number of approximately 1000.
- 04 programs of (4 days) tissue culture training were conducted for 32 participants.
- Two field days were conducted with Agriculture extension staff.
- 66 seed packets were distributed among the PVIC officers under the “Atukotu

Purawamu Ekwemu Negitimu” program to promote urban Agriculture.

- Maintenance of the urban Agriculture model as a demonstration block.
- 05 field programs were conducted at the Diyagama Eco Friendly Agriculture technology unit with a participation of 225.
- About 5,500 leaflets containing technical innovations were distributed.
- Technical advices were provided for over 300 clients including over 15 field visits.

Trainings

- One M.Phil. Student and seven undergraduate students from four different universities (Jayawardenapura, Wayamba, Rajarata, Peradeniya and Ruhuna) completed the final year Research projects at PVIC.
- In-plant training: Four University students and six college students completed their in-plant training at the PVIC.

Radio programs

- 21 officers participated the “Gewatta live radio program by the SLBC
- 03 officers participated the “Web FM” program by “Guwan Viduli Govi Sewaya”.



A 15 acre, park is situated at the Mahinda Rajapakse International sport Complex,

Diyagama, The established eco-system consists of varieties of fruit plants (major & underutilized) and perennials, spice garden, collection of medicinal plants, export agriculture crops, local yams, foliage and flowering plant beds, environment friendly vegetable garden with a plant nursery, bio gas unit, protected agriculture, bee keeping unit, mushroom house, different irrigation systems, dairy and compost unit, a complete meteorology unit and a few green belts with endemic forest species for reforestation.

- An *in situ* banana mother plant collection has been established.
- Replicated field trials are being carried out.
- A growth house for mushroom cultivation has been constructed.

PLAN FOR 2018

Plant Virology

- Identification of virus and virus like diseases in Cucurbits, Legumes and Chilli in Southern Dry Zone region in Sri Lanka. Collaboration program with Angunakolapellassa. Research is being continued.
- Management of Pineapple mealy bug wilt virus (PWV) in pineapple. Research is being continued.
- Potential use of plant antiviral compounds to manage virus diseases in Chilli
- Use of ecological engineering concept for management of viral disease in Chilli. Research is being continued.

Molecular Virology

- Development of a protocol to identify the phytoplasma in seeds
- Investigate the presence of phytoplasma in commercially available seeds. (Bitter gourd, Snake gourd, Ridge gourd, Okra, Papaya , Chilli, Brinjal)
- Identification of virus diseases in Passion fruit by molecular methods.
- Identification of the causal agent of Guava wilt disease by molecular methods.
- Development of transgenic Papaya through *Agrobacterium* mediated transformation.

Tissue Culture

- Micro-propagation of DOA recommended Banana variety “Agra”
- Creating new variants of exotic and local grapes varieties through tissue culture technology for future varietal development.
- Introduction of an effective and low cost lighting system for culture rooms.
- Identification of low cost solidification material for Tissue culture. media.
- Protocol development for planting material production of selected Pomegranate lines through nodal culture technology.
- Development of promising Pomegranate lines through *in vitro* mutation using gamma radiation (Collaboration with ARS Kalpitiya).
- Production of a new Pineapple variety by using cross pollination.

- Production of tissue cultured hybrid Papaya planting material using local hybrid seeds.

Epidemiology

- Development of a protocol for trunk injection of pesticides as a part of an integrated pest management program for controlling Stem borers in Mango and Durian.
- Assessing the field level distribution pattern of white wax scales and determining the management measures in Mango trees and other fruit crops.

Microbiology

- Management of Papaya rings spot virus (PRSV) in Papaya through integrated approach.
- Induced systemic resistance against Chilli veinal mosaic virus in chilli (ChiVMV)

using *Pseudomonas fluorescense*.

Research is being continued.

- Potential use of soil antagonisms for successful management of panama disease in Banana caused by *Fusarium oxysporium* sp. *Cubense*. Research is being continued.

Technology Transfer

- Conducting awareness training programs for Agriculture Instructors - 01
- Participate in 12 live radio programs.
- Continuation of urban home garden unit as a demonstration block.
- Conducting 12 school students training programs.
- Conducting entrepreneur training programs - 02
- Tissue culture (4 days) Entrepreneurs program groups - 04

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	07	05
Program Assistant ((Agriculture)	08	03
Agriculture Instructor	06	09
Research Assistant	06	06
Public Management Assistant	03	04
Technological Assistant	01	01
Driver	02	03
Store Keeper	01	01
Office Employee	01	01
Watcher	04	03
Laborer	20	17
Laborer (Contract)	05	14
Total	65	68

1.4 RICE RESEARCH AND DEVELOPMENT INSTITUTE (RRDI) - BATALAGODA

Though the country's rice production has achieved the level of self-sufficiency in year 2010, rice production was badly affected by the adverse weather condition prevailed in major rice growing areas in past few seasons. Considering the importance of maintaining the stability of rice production to ensure food security of the country, RRDI continued its

effort to strengthen the rice research and development program to develop varieties with high genetic potential and related technologies adaptable to both favorable and adverse weather conditions. In addition, RRDI is also engaged in disseminating new technologies developed by the Institute and producing breeders' seeds of Bg varieties.

BUDGET

Table 1.4.1: Annual Budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	39,443,547	33,950,147	86
Capital	16,156,650	13,437,208	83
Projects			
• National Food Production Program projects			
○ Productivity improvement of rice	3,600,000	3,580,132	99
• Foreign projects			
○ Green super rice	2,161,000	2,159,783	100
○ Closing rice yield gap	4,000,000	3,473,353	87
○ Weedy rice management and characterizing of herbicide resistance	248,078	248,078	100
○ Establishment of model farming village	9,053,100	4,734,312	52
• Local projects			
○ Development of a reliable screening techniques for Fe toxicity	493,000	473,989	96
○ Development of rice varieties for abiotic stresses	1,272,500	1,270,845	100
○ Determination of phosphorus fertilizer requirement	1,450,000	1,444,664	100
○ Identification of biotypes of brown plant hopper	574,100	574,585	100
○ Development of locally adaptable cytoplasm male sterile (CMS) lines	1,000,300	980,052	98
○ Development of new salinity tolerant rice lines to improve rice productivity	1,317,600	1,313,681	100

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
o Introgression of temperature tolerance to mega rice varieties in Sri Lanka	1,630,700	1,642,162	101
o Development of integrated management method for rice field rats	1,358,000	1,344,583	99
o Improvement of grain quality attributes of rice varieties	743,000	731,022	98
o Integrated weed management approach in direct seeded rice (DSR)	355,100	359,171	101
o Establishment of an e-pest surveillance and forecasting system	568,400	578,688	75
o Development of rice varieties for salinity affected flood prone soil condition	620,600	596,883	96
Total	87,080,875	73,864,372	85

PROGRESS

RESEARCH

Rice Varietal Improvement

The varietal improvement at RRDI is focused on developing varieties with higher yield potential and high genetic resistance for pest and diseases. Development of tolerant varieties against salinity, iron toxicity and submergence is also anticipated. Substantial gains have been achieved by developing new elite lines with wide genetic base, resistant to many biotic factors and good grain quality during the year 2017.

4-4½ months age class rice

A total of 11 crosses were made. Ten F₁ populations and 9 F₂ - F₄ populations were established. Two hundred twenty advanced progenies were selected from 16 populations.

Eighteen elite lines were evaluated in yield trial for resistance to major pest and disease, grain yield and grain quality characteristics.

Line numbers 14-1657 and 12-685 were nominated for NCRVT. Advance lines 15 - 98, 15 - 100, 16 - 85 and 16 - 101 were identified as promising lines and selected for further testing.

3½ month age class rice

A total of 18 crosses were made. Twenty five from F₂ to F₄ populations were established. From F₅ generation onwards, 650 progenies from 41 populations were selected.

Sixteen elite lines in preliminary yield trial and 8 lines in major yield trial were evaluated and Bg 10-1407 was sent to DUS test.

Rice lines Bg 10-2398, Bg 10-1407, Bg 10-1258 and Bg 11-802 were multiplied.

3 months age class rice

A total of 7 crosses were made. Twenty one populations belonging to F₂, F₃ and F₄ generations were established and 14

populations were advanced. From F₅ generation onwards, total of 340 progenies from 33 advanced populations were established and evaluated.

15 elite lines in PYT and 15 lines in MYT were evaluated. Bg 14-2382, Bg 16-1003, Bg 16-975, Bg 15-766 and Bg 15-822 were identified as promising lines.

Promising line Bg 11-1051 was nominated for NCRVT.

2½ months age class rice

A total of 8 crosses were made. Seven F₁ generations were established. A total of 26 bulk populations belonging to F₂, F₃ and F₄ generations were established. Five hundred and thirty one progenies were advanced from F₅ generation and 91 progenies were selected.

Twenty elite rice lines and 5 elite rice lines were evaluated in PYT and MYT respectively. Bg 15-1027, Bg 15-961 and 16-2485 were identified as promising. Bg 10-2881, Bg and Bg 13-1265 were tested in VAT.

Quality rice

Sixteen crosses were made. Fifteen F₁ populations were advanced to F₂ generation. Sixty one populations of F₂, F₃ and F₄ were advanced. Four hundred and ninety progenies of F₅ to F₈ generations were advanced.

Twenty four elite rice lines in PYT and seventeen lines in MYT were evaluated. Bg 16-520, WAS-169-B-B-4-2-3, IRO10A107 and Bg 16-2022 were identified as promising lines and nominated for NCRVT.

Seventy five progenies were selected from mutant material of M6 generation of 3 rice

varieties (Suwandel, Bg 94-1, Bg 1165-6) for further advancement.

Stress tolerant rice

Ten back crosses and 7 new crosses for salinity tolerance were made and 10 BC₂F₁ populations were planted. A total of 26 populations belong to F₂, F₃ and F₄ were established and 26 populations were advanced.

A total of 13 crosses were made to incorporate low moisture stress tolerant character to recommended and promising rice varieties. Twenty seven populations from F₂ to F₄ were established and 17 populations were advanced. From F₅ generation onwards, 65 progenies from 2 advanced populations were established and evaluated.

Six crosses were made to incorporate high temperature tolerant character to popular rice varieties. Evaluation is in progress with segregated populations.

Nine populations including 1 BC₂F₁ and 8 BC₁F₁ populations were phenotypically screened for BPH resistance. Marker aided selection (MAS) was performed using RM 463 and B 121.

Hybrid rice

Fifty seven CMS lines, 57 maintainer lines and 181 restorer lines were maintained. A total of 198 crosses were made with selected parental lines.

One hundred ninety four F₁ combinations were tested in test cross nursery. Out of them, 20 crosses were selected for backcrossing in order to develop new CMS and maintainer lines.

Advanced back cross combinations (BCN i -76 populations, BCN ii - 49 populations, BCN iii - 45 populations, BCN iv - 31 populations,

BCN v - 71 populations) were evaluated with their pollen parents.

Six exotic hybrids (CH3, CH4, CH5, CH6, CH7 and CH8) were evaluated with two locally developed hybrids and inbred variety Bg 403. However none of the exotic hybrid varieties was better.

F₁ seeds of Bg 407H and recently developed hybrid Bg CMS 4A/R147 were produced.

Nuclear seeds of 2 promising hybrid combinations namely Bg CMS1A/1B and Bg CMS 4A/B (7.0 kg each) were produced.

MA2 which is an aromatic rice line with high demand for biscuit production was maintained.

14R, 3½ month aged round shape red pericarped restorer line was further improved.

Floral characteristics of 16 selected inbred varieties were studied to select suitable varieties for developing new CMS lines. Rice varieties belonging to 3½ month and 4 month age groups showed high flower opening percentage from 12.00 noon to 1.00 pm while Bg 305 recorded high flower opening percentage during 11.00 am -12.00 noon.

Eighty progenies from each 1B and 4B lines were maintained to keep their purity.

Purification of segregated population obtained from selection 'Pollonnaruwa' was continued and 80 'samba' type progenies and 25 nadu type progenies were selected for future studies.

Six promising CMS lines (BgCMS5A, BgCMS6A, BgCMS7A, BgCMS8A, BgCMS9A, Bg CMS10A) were identified via back cross breeding.

Variety Bg 357 was crossed with available restorer HRSP668, and 15 BC₁F₁ lines were selected and advanced for back crossing in

order to develop new restorers with better characteristics.

Rice Varietal Improvement through Biotechnology

Two BC₂F₂ populations of Bg 352 and one BC₂F₂ population of Bg 357 were produced by back crossing for developing drought tolerant introgression lines. Three BC₂F₂ bulk populations were screened under severe artificial drought condition and ten highest yielding individuals were selected from each population. Seeds of selected 30 individuals were multiplied under irrigated condition.

BC₂F₂ population of Bg 366 produced for developing anaerobic condition tolerant introgression lines were screened. Forty advanced lines were selected for further evaluation.

Eleven BC₂F₈ lines of Bg 360, twelve BC₂F₈ lines of Bg 455 and five BC₂F₈ lines of Bg 379-2 with submerge tolerant trait were identified.

A total of 10 lines were selected from BC₂F₃ populations of variety Bg 352 and Bg 357 for developing BLB tolerant introgression lines.

Eight crosses were made using Bg 358, Bg 352, At 362 and Bg 300 varieties as recurrent parents with IRBB60 and IRBB65 as donors to develop advance BLB resistant lines.

BC₂F₆ generation (BLB resistant) of 'Pokuru samba'/IRBB60 cross was hybridized with blast resistant lines obtained from 'Pokuru samba'/ Tetep cross to pyramid both blast and BLB resistance in one genotype. F₁ crosses were confirmed by linked molecular markers pTa248 for Xa21 gene for BLB and RM224 for Pi54 gene for Blast resistance.

Fourteen BC₂F₅ lines were identified as salinity tolerant introgression lines by back crossing of Bg 300 with Pokkali. Two lines were submitted for PYT.

Ten BC₂F₄ lines were identified by back crossing Bg 360 with 'Suwandel' for developing fragrant introgression lines. Selected plants were hybridized with Iginimitiya variety in order to increase the fragrance level.

16TC80, a white pericarped rice line which was developed by seed calli mutation of red pericarped At362 was evaluated in yield trials of 3½ age group. It showed superior characters over At 362.

BC₂F₂ long slender and fragrant rice lines and BC₂F₅ Short round fragrant rice lines were developed using Bg 94-1/Basmathi (Market variety) and BC₂F₅ Bg 360/ Suwandel, Bg 360/ Iginimitiya crosses respectively.

F₄ generations of At 353/Bg 300 and Bg 300/ Bg 94-1/ H₄ were advanced in Single Seed Descent method to be space planted and evaluated in F₇ generation

Grain Quality

A total of 1236 samples from NCRVT entries and advanced breeding materials were tested for major grain quality characters and found all the lines were within the acceptable level.

Sixty four rice varieties including traditional varieties were evaluated for selected acceptable sensory quality characteristics and multiplied.

Thirty four rice samples collected directly from millers and market in different areas of Sri Lanka were analyzed in the laboratory using a standard methodology to determine

grain quality parameters including physical, physicochemical properties in order to revise Sri Lankan Standards.

Rice based yoghurt was developed using cooked rice of 5 rice varieties and further development is expected using rice flour.

Evaluation and multiplication of forty exotic germplasms received from IRRI were completed and germplasms were handed over to PGRC, for conservation.

Disease Management

Total of 581 rice entries were screened against bacterial leaf blight (BLB) disease during Maha 2016/17 and Yala 2017. Among them, At 13-3791 showed resistant reaction against BLB in both seasons. Variety Zhonghua, Bw 16-921 and Bw 16-818 showed resistant reaction and another 7 entries showed moderately resistant reaction against the disease only in one season.

Total of 4108 rice entries were screened against rice blast disease. In Maha 2016/2017 1092 entries were categorized as resistant to blast. However, in Yala 2017 season, blast disease did not occur.

Four fungicides were evaluated for sheath blight disease under artificially inoculated condition. It was found that, foliar application of Hexaconazole, Azoxystrobin + Tebuconazole and Propiconazole at dilution rates of 20 ml, 8 ml, and 10 ml per 10 l of water respectively were effective in controlling the disease.

Reduction of BLB disease was observed in rice crop applied with additional 10 kg/ha of MOP within 7 days after observing the disease symptoms.

Pest Management

Seasonal variations of Paddy bug was studied since Maha 2015/16 and high population was observed during Maha season compared to Yala season.

Gall midge damage in 2480 rice breeding lines were assessed under pesticide treated condition to determine their reaction to the pest and 138 lines were identified as susceptible to the pest. Removal of these susceptible lines from the breeding program is suggested.

Two thousand three hundred and fifty seven rice lines were screened to identify resistant sources for BPH.

Different rates of Ethiprole were tested against paddy bug and found that application of Ethiprole at the rate of 800 ml/ha is effective.

Identification of rat species associated with rice cultivation, assessment of their population and crop losses were done in Kurunegala, Gampaha and Polonnaruwa Districts. *Rattus rattus* and *Bandicota indica* were identified as associated species in rice cultivations and human habitats as well. Booting stage is the most critical period for rat damage.

A field study was conducted to find out different pest incidences under different crop establishment methods and insect pest counts were taken in weekly intervals.

A study was conducted to determine the status of stem borer parasitism in conventionally grown and organically grown rice crops in the region. *Tetrastichus schoenobii* was the only egg parasitoid recorded from this area while *Poecilotraper ataeniata*, *Tetrastichus oyyari*, *Tropobracons choenobil* and *Cotesia flavipes* were identified as larval / pupal parasitoids. Significantly low stem borer

parasitism was observed in pesticide treated crops when compared to the untreated crops. New stem borer species was also found from the above area and authentic identification of this species needs to be done. This species was first recorded from the similar experiment conducted at Bombuwela in 2016.

Weed Management

Phyto-toxicity of MCPA on 4 rice varieties/ lines namely Bg 250, Bg 251, Bg 10-2907 and Bg 13-1265 was tested and found that, there was no significant effect of MCPA on the plant or grain yields at the tested rates.

Different spray regimes of 4 herbicides were tested along with un-weeded control and hand-weeded control to compare weed controlling efficiency (WCE). Sulfentrazone 480 g/l SC followed by Metamifop10% EC, Rinskor 2.7% EC (500 ml/ha within 7-15 DAE) and Metamifop (1200 ml/ha within 8-12 DAE) Carfentrazone ethyl (80 g/ha within 14-21 DAE) were found to be more effective in controlling almost all weed species found in wet seeded paddy cultivation including resistant bio-types with more than 75% WCE.

Ten rice varieties/lines were evaluated for their weed competitiveness and line At 10-1240 and IR04A395 showed high weed-competitive ability. AERON 9-3, AERON 10-26, At 10-1327, At 13-2715, Bw 11-3403 and IRRI 156 were categorised as weed-competitive varieties whereas Bw 12-574 and Zhonghua as moderately weed-competitive varieties.

Traditional (Suwandel, Pachchaperumal, Kaluheenati), old improved (H4, H7)) and new improved (Bg 250, Bg 251, Bg 300, Bg 450, Bg 407H) rice varieties were screened to identify their competitiveness against weedy

rice. 'Suwandel' was found to be a weedy rice competitive rice variety showing 0.77 competitiveness and the lowest grain yield reduction. 'Kaluheenati' showed moderately competitive ability while Pachchaperumal, H4 and H7 showed slightly competitive ability against weedy rice. Weedy rice competitive rice varieties could be incorporated in weedy rice management package.

Soil Fertility Management

Phosphorous application in alternative seasons was compared with no P application and DOA recommended P application to determine its long term effect on soil P content and grain yield of rice. There was no difference in yield between different treatments in current 11th season.

Combined application and solitary application of chemical fertilizer and organic manure were tested along with no fertilizer application (control) in long run. According to 33rd seasons' results, application of organic manure along with chemical fertilizer is very much important to achieve highest grain yield. Yield increases due to application of OM, NPK and OM + NPK over the control are 17%, 147% and 164% respectively.

Elite rice lines belonging to 3½ months age were tested for nitrogen response using Bg 352 as standard rice variety. None of the test lines produced higher yield over Bg 352. New 2½ months age rice line Bg 2907 produced higher yield than Bg 250 in all N levels indicating it as the most N responsive line in that age group.

Different K fertilizer levels added as basal and top dressings with and without straw were tested to see K content in plant and soil, and

grain yield of rice. There was a significant response of rice for application of K fertilizer. Yield improvement due to straw and K fertilizer application over control was 17%. Application of rice straw at the rate of 5t/ha is enough to supply K requirement. Application of rice straw with K at basal produced the highest grain yield.

Selected rice varieties were screened for Fe, Zn and heavy metal accumulation. The highest level of Zn (31 mg kg⁻¹) was recorded by variety At 306 while the lowest level was recorded by Bg 310 (24.6 mg kg⁻¹)

Yield performances of Bg 300, At 303, Bg 304, At 306, Bg 358, At 362, Bw 363, Bg 366, Bw 367, Ld 368, Bg 369, H4, Bg 11-11, Bg 379-2, At 401, At 405, Bg 450, Bw 453, Suduheenati and Madathawalu were evaluated under organic conditions. At 362 showed its superiority by giving 4.74 t/ha under organic condition. There was no statistically significant yield difference between the tested traditional varieties and improved varieties.

New fertilizer treatments namely CIC Sulfonite (18.75 kg/ha)+ DOA Recommended NPK rate, CIC Micro V (18.75 kg/ha)+ DOA Recommended NPK rate, Laurance's liquid fertilizer (31.25 l/ha)+ DOA Recommended NPK rate, Opex paddy 01 package + 1st and 2nd top dressings of N, K of DOA Recommendation and Opex paddy 02 package+ 1st and 2nd top dressings of N, K of DOA Recommendation were evaluated along with Compost (10 t/ha), NPK DOA Recommendation and no fertilizer application. All tested fertilizer treatments showed a significantly higher yield compared to no fertilizer treatment and comparable yields with DOA Recommendation.

Wormy compost 1 t/ha, wormy compost 3 t/ha, Organic manure (Straw 05 t/ha+ Green manure 01 t/ha+ Compost 04 t/ha, partially burned paddy husk 625 kg/ha) were evaluated along with no fertilizer application.

Water Management and GIS

Behavior of weeds with water depth and duration at the early stage of the rice crop was studied in machine transplanted rice fields. Depth of water was maintained up to 5 cm, 0 cm and -5 cm for one week, two weeks and three weeks duration. Sedges and grasses were significantly high in 0 cm and -5 cm depths of water. But there were no difference of broad leaves with different water depths. No significant differences were found among duration of keeping water.

A field experiment conducted to find out the most critical stage and the duration of water stress that affect on rice production using Bg 304 rice variety showed that rice plant could tolerate the water stress for one week at flowering stage, 2 weeks at late vegetative stage and 3 weeks at early vegetative stage.

A pot study conducted to identify the effect of salicylic acid (SA) in overcoming water stress in rice showed that the application of SA with a concentration of 0.7 mM in 20 ml or 25 ml at 15 days after sowing could be used to reduce water loss by the plant. It was also noticed that, irrigation interval can be extended by further 7 days when compared to the control.

Two experiments were initiated to study the effect of temporal variation of climatic condition on rainfed and irrigated rice cultivation.

An experiment was started to find out the most appropriate method of AWD for irrigation

during flowering of rice to further save irrigation water

Agronomy

Thirteen new rice lines were tested with standard check varieties in 13 locations under NCRVT program. At 13-1543 (white, long/slender) of 3 months age and Rathu Suduru (Red short/round) of 3½ months age showed good adaptability in both Dry/Intermediate and Wet zones. At 13-3791 showed a better adaptability in the Wet Zone.

Eighty two inbred rice lines were screened along with Bg 300, Bg 251, Bg 304 and IRDTN 7-11 as the standard checks to identify their drought tolerance/escape ability under simulated drought stress condition. Among the lines tested, K3, K4, K6, K 7, K 10, K11 K 14, Bg 16838, Bg 16-867, Bg 16-2397, SACTH 401, SACTH 102 and SACTH 103 gave high yields and filled grain percentages and were identified as promising drought escape/tolerant lines.

Twenty varieties of 3-3½ months age group, including both newly improved and traditional cultivars were tested to identify rice varieties with high temperature tolerance based on their agronomic and physiological traits under 3 simulated temperature stress condition (ambient/control <35 °C, 35-37 °C and 38-40 °C) in a thermo-gradient chamber. Bg 352 and Pachchaperumal showed high pollen sterility of 13.3% and 20% respectively. Madathawalu, Bg 366 and Bg 94-1 gave highest yields. The filled grain percentage of all varieties were above 70 % in all temperature treatments while Bg 369, Kaluheenati, Bg 94-1, Bg 304, Pachchaperumal, Bg 305 and Suduheenati had >85 % filled grain percentages at 38-40 °C.

Though pollen sterility is increased at temperatures above 35 °C, the results of this study did not show such relationship.

Eight rice lines belonging to 3½ months (MA 2, CL 407, CL 406, CL 210, CL 107, CL 405, CL 303 and CL 305) were tested against Bg 94-1 to identify their agronomic characters and yield potentials under researcher managed condition. MA 2 took more than 3½ months (114 days) to mature while panicle length of MA 2, CL 407 and CL 406 were comparable to Bg 94-1 and significantly higher ($p < 0.05$) than the other lines tested (> 25 cm). Yields of MA 2, CL 407, CL 406, CL 405 and CL 305 were significantly high ($p < 0.05$) and comparable to the standard check. The highest thousand grain weight was recorded in Bg 94-1 (28.8 g).

Effect of 3 selected water depths and seeding rates on growth and yield of rice sown under flooded condition was evaluated. Seedling density decreased significantly with increasing water depth and seeding rate but tiller and panicle densities did not vary among the water depths or seeding rates. Weed density and weed dry weight decreased significantly with increasing water depth. Water depth also had a significant effect on yield. These results revealed the possibility of using a seeding rate of 100 kg/ha with 2.5-5 cm of water depth for seeding rice under flooded condition.

A total of 23 rice lines were screened to identify their germination ability under standing water condition using Ciherang AG1+SUB1 and IR 64+AG1 as tolerant checks. Survival score under 10 cm of standing water of all varieties were less than 25% while IR 14D 202 and IR 14D 201 recorded survival scores of 24% and 21%, respectively which

were higher compared to Ciherang AG1+SUB1, IR 14D 157 and IR 14D 202 recorded the highest survival score comparative to Ciherang AG1+SUB1 (40%), IR 14D 201, IR 14D 202, IR 14D 155, Bg 310, Bg 300 (selected), Bg 300+AG1(1) and Bg 300+AG(2), recorded survival score $\geq 20\%$ which were comparable to Kho Halon On and Mazan Red. Therefore, IR 14D 157, IR 14D 202, IR 14D 201, IR 14D 155, Bg 310, Bg 300 (selected), Bg 300+AG1(1), Bg 300+AG(2), Kho Halon On and Mazan Red were selected for further testing.

Three experiments were conducted to identify suitable varieties, spacing and seedlings/hill and planting depth on growth and yield for mechanical transplanted rice. Bg 403, Bg 379-2, Bg 406, Bg 450 and Bg 454 under 4-4½ months and Bg 357, Bg 352, Bg 366, At 362, Bw 367 and Bg 300 under 3-3½ months maturity groups were tested. Four spacing levels (30 cm x 12 cm, 30 cm x 14 cm, 30 cm x 16 cm, 30 cm x 18 cm), 3 different seedlings/hill (4, 6, 8) and 5 planting depths ranging from 3 cm-1.5 cm were evaluated. Bw 367, Bg 357, Bg 406, Bg 450, Bg 454, Bg 379-2 and Bg 403 gave higher yields and performed well under mechanical transplanting. There was no significant difference in yields among the spacing levels or seedlings/ hill in mechanical transplanting. Yield was also not affected with planting depth. Therefore, the possibility of using a range of different depths in mechanical transplanting depending on the existing soil type is highlighted.

Bg 357 and At 362 (3-3½ months), and Bg 403 and Bg 379-2 (4-4½ months) rice varieties were evaluated under different establishment methods - mechanical transplanting (MT),

seedling broadcasting (SB) and wet-direct seeding (DS). Ground cover percentages, tiller number, panicle number, days to 50% heading, maturity duration and grain yield were recorded. DS recorded the earliest heading and maturity while MT and DS recorded significantly higher yields compared to SB for 3½ month varieties but MT produced higher yields compared to SB and DS for 4 months varieties. The yields recorded under MT and SB in Ibbagamuwa and Pollonnaruwa farmer fields were significantly higher compared to DS.

SEED PRODUCTION

- Following amounts of breeder seeds were produced.

Table 1.4.2: Amount of breeder seeds produced

Age class and variety	Seed Quantity (kg)		Total
	Maha 2016/17	Yala 2017	
<u>150-180 days</u>			
Bg 3-5	120.0		120.0
Bg 38	140.0		140.0
Bg 407	120.0		120.0
Bg 745	160.0		160.0
<u>4 months</u>			
Bg 379-2	82	82	164.0
Bg 403	41	143.5	184.5
Bg 406	41	20.5	61.5
Bg 450	20.5	61.5	82.0
Bg 455	20.5	41.0	61.5
<u>3½ months</u>			
Bg 94-1	164.0	143.5	307.5
Bg 352	246.0	255.5	501.5
Bg 357	61.5	82.0	143.5
Bg 358	143.5	102.5	246.0
Bg 359	225.5	82.0	307.5

Age class and variety	Seed Quantity (kg)		Total
	Maha 2016/17	Yala 2017	
Bg 360	225.5	143.5	369.0
Bg 369	20.5	41.0	61.5
Bg 370	246.0	61.5	307.5
Bg 374	184.5	41.0	225.5
<u>3 months</u>			
Bg 300	410.0	307.5	717.5
Bg 310	102.5	82.0	184.5
<u>80 days</u>			
Bg 250	80.0	60.0	140.0
Bg 251	120.0	80.0	200.0
Total	2,974.5	1,830.5	4,805.0

- The following quantities of purified seeds of traditional rice varieties were produced.

Table 1.4.3: Amount of purified seeds produced

Variety	Seed Quantity (kg)		Total
	Maha 2015/17	Yala 2017	
Sudu heenati	40	60	100
Kalu heenati	25	40	65
Suwandal	20	40	60
Pachchaperumal	30	60	90
Madathawalu	30	80	110
Pokkali	15	60	75
Herath Banda		40	40
Murungakayan	60		60
Beheth Heenati	30	50	80
Rathel	20		20
Kahawanu		80	80
Kuruluthuda	20		20

- 2,863 kg of seeds of traditional rice varieties were produced and sold to farmers.
- 1,205 bushels of seed paddy (foundation, registered and certified) of popular varieties were produced and gave out.

SPECIAL PROJECTS

Following projects were implemented.

- National Food Production Program projects
 - Productivity improvement of rice
- Small Scale Research and Development projects
 - Green super rice (Funded by IRRI)
 - Closing rice yield gap in Asia (Funded by IRRI)
 - Weedy rice management and characterizing / quantifying of herbicide resistance in weeds (Funded by IRRI)
 - Establishment of a model farming village for high quality and high productivity of rice in Sri Lanka (Funded by KOPIA)
- National Agricultural Research Plan projects
 - Development of rice varieties for abiotic stresses
 - Determination of phosphorus fertilizer requirement for rice
 - Identification of biotypes of brown plant hopper
 - Development of locally adaptable Cytoplasm Male Sterile (CMS) lines
 - Development of integrated management method for rice field rats
 - Development of new salinity tolerance rice lines to improve rice

productivity under salinity affected areas.

- Development of BPH resistant new rice lines as eco-friendly approach for BPH management
- Introgression of heat tolerance to mega rice varieties in Sri Lanka to develop new segregating populations
- Investigation of patho type diversity of the bacterial leaf blight pathogen *Xanthomonas oryzae pv oryzae* in Sri Lanka

TECHNOLOGY DISSEMINATION

- Trainings on grain quality of rice for university students, students of agriculture schools, school children and farmers
- Field demonstrations and farmer awareness programs for the establishment of a model farm village in Yaya 09, Rajanganaya was continued. Accordingly, different crop establishment methods and weedy rice control package were demonstrated.
- Eleven awareness programs (2 on seedling broadcasting, 1 on laser leveling, 3 on land preparation and 5 on alternative wetting and drying technique) for farmers were conducted.
- One hundred and six training programs of different levels for different types of trainees were conducted by the RRD I for total of 4,104 participants as given below. It included special 2 day training on Rodent identification and ecologically based rodent management.

Table 1:4:4 Summary of training programs conducted in 2017

Type of Program	No. of Programs	No. of Participants
Farmer trainings (one day)	22	706
Officer trainings	29	857
Diploma student trainings	09	566
University student visits	09	529
School children visits	37	1356
Total	106	4,014

- Seven hundred and forty soil samples received under Soil Test Based Fertilizer Recommendation program and National Food Production Program were analyzed and specific fertilizer recommendations were issued based on the results.
- Twenty four samples brought by farmers were inspected for diagnosis of pests and diseases, and appropriate instructions were given for the control of pests and diseases
- Five farmer fields were inspected for diagnosis of pests and diseases, and instructions were given for the control of pests and diseases.
- RRDI officers participated as resource persons for 12 radio programs related to rice cultivation.
- Technical support was provided for one video program telecasted.
- Officers attended as resource persons for 10 trainings organized by the other organizations/ units of DOA.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- Fundamentals of molecular biology and biotechnology. Agricultural Biotechnology Centre, University of Peradeniya (10 days)
- Mutation breeding by gamma ray radiation for flowers, fruits and rice. Division of Radiation Breeding, NARO, Japan. 4 September-17 November 2017.
- Community seed bank training program. PGRC, Gannoruwa. 12-14 December 2017.
- Training course on Breeding seed production and technology for staple crop in Southeast Asia. 8 August 2017.
- Workshop on Knowledge sharing in developing national competency standards for the occupation of tissue culture Lab Assistant. National Apprentice and Industrial Training Authority.
- Seminar on Agriculture Biotechnology Application for developing Countries. 07-June – 06 July 2017, Beijing China.
- Training course on ‘Field Calculator’. 23-24 February 2017, IRRI, Phillippines.
- Workshop on finalization of research priorities in plant protection. 27 February 2017. SLCARP, Colombo.
- Write-shop for Development technical bulletins on rice problems for plant doctors. 02 - 03 March 2017. Plant Protection Service, PGRC, Gannoruwa.
- Seminar on Current status of seed-borne diseases of vegetables in Sri Lanka. 02 March 2017. HORDI, Gannoruwa.
- Annual progress review and way forward workshop on PCCP. 18-19 December 2017, Kandy.

- Training course on biological control of crop pests and diseases. 17-3 May 2017. Beijing China.
- Capacity building program on GHG inventory development and other components for the preparation of the third national communication of climate change of Sri Lanka. 12-15 December 2017. Center for Banking Studies, Rajagiriya.
- Training on Ecological management of rodents, insects and weeds in rice agro-eco systems. IRRI, 25 September – 06 October 2017. Los Banos, Philippines..
- Training on Data management. 19-20 January, 2017. PGIS, University of Peradeniya.
- Workshop on Climate change and sustainable development. 03 February, 2017. CARP, Colombo,.
- Workshop on Drought and flood. 23 June, 2017. AICC, Gannoruwa.
- Workshop on Climate change and soil conservation. 29 June, 2017. ISTI, Gannoruwa.
- Workshop on Climate change 30 June, 2017. CARP, Colombo.
- Workshop on Organic agriculture. 15 September, 2017. PGRC, Gannoruwa.
- Workshop on Rice cultivation with water scarcity. 24 October, 2017. Department of Irrigation, Colombo.
- Workshop on bio-fertilizer and bio-pesticides. 29 November, 2017. IWMI, Battaramulla.
- introductions and improved lines were established and dried seed samples were conserved at RRDI short term germplasm conservation unit
- 200 sets of seed samples were distributed among other research stations, schools, universities, NGOs and other interested group according to their request.
- Six exotic rice lines were evaluated for yield potential, pest and disease reactions and other agronomic traits. Exotic lines SAC-101 and SAC-105 were identified as promising lines.
- Different rice samples received from Sri Lanka Customs, Consumer Affairs Authority and other sectors were tested for quality standards.
- Facilities were provided for 40 students of agriculture schools/technical college and 18 university students to carry out their in plant trainings as a partial fulfillment of their respective course under the supervision of officers of RRDI.
- Facilities were provided for 6 undergraduate students to carry out their research projects under the supervision of officers of RRDI.
- Facilities were provided for 13 seminars / meetings with 365 attendees.
- Various publications of the DOA worth of Rs. 65,843.00 were sold at the outlet at RRDI.

OTHER ACTIVITIES

- Seven hundred and fifty rice accessions including traditional cultivars,

PLAN FOR 2018

Research

- Development of elite lines of 2¹/₂, 3, 3¹/₂, and 4-4¹/₂ months age groups through

- conventional breeding for favorable conditions
- Evaluation of elite rice lines of 2¹/₂, 3, 3¹/₂, 4-4¹/₂ and 5-6 months age groups in PYT and MYT
 - Multiplication of elite rice lines (advanced generations) of 2¹/₂, 3, 3¹/₂, 4-4¹/₂ and 5-6 months age groups
 - Development of abiotic stress tolerant (drought/ submergence/ anaerobic germination/ high temperature/ salinity) and quality elite lines through conventional / back crossing and marker assisted selection or mutation breeding
 - Development of new hybrids through heterosis breeding
 - Conservation of germplasms through multiplication
 - Screening of rice varieties for salinity, drought, high temperature, cold, submergence and anaerobic germination tolerance
 - Screening of breeding lines and new introductions for important pests and diseases
 - Assessment of heavy metal contents in grains of rice cultivated under organic condition
 - Testing of new fertilizer materials
 - Investigations on pathotype diversity of bacterial leaf blight pathogen
 - Testing of new pesticides/fungicides for major pests/diseases of rice
 - Studies on major rice-field-rat species and their abundance
 - Development of integrated management method for rice field rats
 - Assessment of pest damages in rice crops established by different methods
 - Evaluation of chemical constituents present in volatile compounds isolated from rice for egg laying behavior of paddy bugs
 - Study on seasonal variation of natural parasitism of rice stem borer
 - Evaluation of silica containing products as nutrient cum plant-resistance inducers for thrips, leaf folder and BPH in rice
 - Impact of crop/ pest management practices adopted by farmers in major rice growing areas in Sri Lanka on the activity of egg parasites of BPH
 - Screening of NCVT rice lines and breeding lines for resistance to Brown plant hopper (BPH) and Gall midge
 - Bio-efficacy evaluation of new candidate herbicides and re-evaluation of herbicides
 - Evaluation of weed suppressive ability of rice lines
 - Study of herbicide resistant weeds in rice field
 - Investigation of methods to control weeds in rice
 - Evaluation of breeding lines for Nitrogen response
 - Evaluation of elite rice lines in NCRVT
 - Large scale demonstrations on mechanically transplanted rice with other popular establishment methods
 - Development of a suitable agronomic package for ultra-short age rice varieties
 - Long term effect of P application on soil P content and grain yield of rice
 - Long term effect of K fertilizer on soil K content and grain yield of rice
 - Long term effect of application of organic manure and chemical fertilizer to rice fields

- Evaluation of climatic suitability for rice cultivation
- Identification of critical growth stage and the duration of moisture stress on rice
- Modeling of yield in NCRVT locations (APSIM Oryza and Aqua Crop)

Seed Production

- Production of breeder seeds of 23 recommended rice varieties
- Multiplication of 16 elite lines
- Production of purified seeds of 12 selected traditional rice varieties
- Production of seed paddy of popular rice varieties

Special Projects

- Closing rice yield gap in Asia
- Establishment of model farm village
- Development of rice varieties for abiotic stress
- Determination of phosphorus fertilizer requirement
- Development of new salinity tolerant rice lines
- Development of BPH resistant new rice lines as eco-friendly approach
- Introgression of temperature tolerance to mega rice varieties in Sri Lanka
- Investigation of pathotype diversity of the Bacterial Leaf Blight pathogen
- Development of integrated management method for rice field rats
- Role of allelo chemicals in rice responsible for egg maturity of paddy bug

RICE RESEARCH STATION – AMBALANTOTA

The prime objective of the Rice Research Station, Ambalantota is to develop red-pericarped, salinity tolerant, short-maturity and high yielding rice varieties with improved grain quality attributes. The station is also responsible for developing related technologies to improve productivity especially in southern area and producing of breeder seeds of recommended “At” varieties.

PROGRESS

RESEARCH

Rice Varietal Improvement

Forty new crosses were made. Thirty early segregating generations were selected and maintained separately. From F₅ generation onwards, about 750 progenies were maintained and selected for generation advancement. Thirty five lines were evaluated in PYT and 14 lines were selected to MYT. Thirty five lines were evaluated in four MYT and three lines (At 13-1532, At 15-712 and At 15-797) were nominated to evaluate in NCRVT. Three varieties of 3 months age group; At 13-3048 (red /IB grain type), At 13-2715 (red/ LS grain type) and At 13-1543 (white/LM grain type) were tested under NCRVT. At 10-1374 (red/ LM grain type), At 13-3791 (red/LS grain type) and At 11-1425 (white/ LS grain) were nominated to evaluate in VAT. At 10-1350 was tested in LSVAT. White aromatic line At 09-898 was tested under LSVAT and identified as a high yielding pipe line variety.

Agronomy

Agronomic traits of 15 popularly grown improved and 15 traditional rice varieties were evaluated during Maha 2016. All the traditional varieties were taller than improved varieties and most of them lodged totally or partially during grain filling stage. Except 4 improved varieties, rest gave yield more than 5 t/ha. Traditional varieties gave lower yields below 5 t/ha. Although some traditional varieties inherit desirable traits for high yields, plant height accompanied by lodging as well as grain shattering and unfilled seeds per panicle had affected the yield badly.

Seed dormancy of 24 rice varieties having different maturity durations and grain types were studied. A huge variation in dormancy period among varieties was observed. The shortest and longest dormancy periods were reported in At 373 and At 303 (11 days and 55 days respectively). At 373 and At 08-861 with lowest husk thickness of 0.065 mm and 0.075 mm respectively recorded the lowest dormancy period (less than 20 days from harvest). Among the six scented varieties, At 373, At 898 and At 405 showed the lowest husk thickness and at the same time lowest dormancy period compared to most of the tested varieties. However, varieties with higher husk thickness always did not show prolonged dormancy. Neither grain type nor maturity duration has influenced on the dormancy period of selected varieties.

Ten new rice lines were tested with standard check varieties during Maha 2016/17 season and Yala 2017 under NCRVT program. Among them At 11-1425, At 13-3791, At 13-3048, At 13-1543 and At 13-2715 were identified as promising.

Twelve trials were conducted in Matara and Hambantota districts to determine the adaptability of new elite rice lines namely At 10-1374, Bw 11-3403, Bg 10-2881 and Bg 13-1265. At 08-898 was found to be more adaptable than that of the standard check variety.

Response of At 08-1078 and At 1350 to added N was tested and 100 kg N ha⁻¹ was found as the most suitable rate for obtaining optimum yield with minimum pest and diseases incidences.

Biofilm bio-fertilizer with 80% of the DOA recommended NPK level was found to be the most effective fertilizer combination for rice.

Seventy seven drought tolerant exotic rice lines received under INGER were tested under controlled conditions to identify drought tolerant varieties.

Weed Science

At 362, Bw 367, At 308, At 307 and Bg 455 rice varieties performed well under submerged conditions showing higher seedling count, normal growth and higher yields indicating the suitability to establish under flooded condition. After crop establishment, maintaining water to 5 cm height until 21 days reduced grasses by 84% and sedges by 72% suggesting that management of water at the early stage of the crop is an effective tool for management of grass weeds and sedges in direct seeded rice.

A survey conducted on herbicide usage among rice farmers in Hambantota district revealed that 14 herbicides belonging to 3 different mode of action groups are used to control weeds in rice cultivation in the area. Thirty three percent of the farmers have used protoporphyrinogen oxidase-inhibitors (PPO),

28% of them have used ALS-inhibiting herbicides while the others have used Acetyl CoA carboxylase (ACCase) inhibitors. Sixty three percent of the respondents have used Carfentrazone-ethyl 240 g/1EC while 27% used bispyribac sodium and its pre-mixed formulations.

Cyperus difformis (66%) and *Cyperus iria* (58%) are the most problematic weed species found in the area. Sixty seven per cent farmers complained that available herbicides are not effective in controlling the existing weed species. Eighty seven percent farmers have mixed two or three herbicides together before application. Majority (56%) of the respondents have applied herbicides once per season and the others have applied twice. Fifty three percent farmers do not follow the recommended dosage of herbicides. Inappropriate use of herbicides might be the reason for occurrence of resistant weeds to most frequently used herbicide groups such as ALS-inhibitors in this area.

Study was conducted to identify the development of resistant biotypes of *Cyperus difformis* in Hambantota District. Results indicated the possible resistance developed in some populations to MCPA and bispyribac sodium 40 g/l + metamifop 100 g/l SC. ED₅₀ values obtained from the dose-response experiments showed that some *C. difformis* populations were 1.95 times resistant to MCPA and 2.4 times resistance to bispyribac sodium 40 g/l + metamifop100 g/lSC when compared with the other populations indicating the development of resistant biotypes. There was no evidence for resistance in *C. difformis* to carfentrazone-ethyl 240 g/1EC.

Eight recommended rice varieties namely At 307, At 308, At 362, Bg 300, Bg 352, Bg 360, H4 and At 373 were evaluated for weed competitiveness. Lowest weed population was found in H4 rice variety at 6 weeks after sowing. At 307, At 308, At 362, and At 352 varieties showed moderate weed competitiveness.

Grain Quality

Grain length and length width ratio of fifty local rice varieties were measured and found that they do not fit well with present grain classification. Therefore, a new classification combining the grain size based on the length and grain shape based on the length/width ratio is proposed.

SPECIAL PROJECTS

Following projects were implemented.

- Improvement of grain quality attributes of rice varieties (Funded by NARP)
- Integrated weed management approach in direct seeded rice to reduce the herbicide dependency and yield losses due to weeds in Hambantota District (Funded by NARP)

TECHNOLOGY DISSEMINATION

- Trainings were given to students of Agriculture Schools as a partial fulfillment of the Diploma course
- Information was given to university students, technical staff of DOA, school children, and farmers who visited the institute
- Facilities were provided to 2 undergraduate students and 2 post

graduate students to carry out their research project

- Twenty awareness programs on effective weed management in rice cultivation were conducted for farmers and officers of the DOA
- Two radio programs were conducted on effective weed management strategies on rice
- Fifteen training programs on effective rice weed management strategies were conducted

BREEDER SEED PRODUCTION

Following amounts of breeder seeds were produced.

Table 1.4.5: Amount of breeder seeds produced

Variety	Quantity (kg)		Total
	Maha 2016/17	Yala 2017	
<u>3 months</u>			
At 307	140	140	280
At 308	120	140	260
At 311	40	40	80
<u>3½ months</u>			
At 373	80	100	280
At 362	-	300	300

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- 26th Asian Pacific Weed Science Conference. 19-22 October 2017, Kyoto, Japan
- Knowledge sharing of agricultural technologies for climate change mitigation. 11 – 17 October 2017, Korea

PLAN FOR 2018

- Germplasm evaluation and maintenance of parent material
- Generation of recombinant genetic material through hybridization
- Evaluation of promising lines of 3 and 3½ months age groups through bulk and progeny selection
- Evaluation of elite rice lines in PYT and MYT
- Multiplication of promising breeding lines
- Breeder seed production of recommended 'At' varieties
- Conducting trials of NCRVT and VAT
- Evaluation of rice varieties for glycemic index and related quality attributes
- Assessment of heavy metal content in improved and traditional rice varieties
- Screening of locally popular rice germplasms for submergence tolerance
- Evaluation of different rice seed priming methods under submerged conditions
- Survey on weeds and weed management practices in Hambantota District
- Conducting NCHST
- Study on herbicide resistance in *Cyperus difformis* and *Cyperus irria* populations in DSR in Hambantota District
- Screening of locally popular rice germplasms for submergence tolerance and development of eco-friendly weed management technology
- Testing newly developed rice lines for response to nitrogen fertilizer
- Study on the effect of bio film bio fertilizer application on growth, yield and quality parameters of rice

- Screening of exotic rice germplasms (INGER varieties) for drought tolerance

RICE RESEARCH STATION – LABUDUWA

Rice Research Station, Labuduwa is responsible for developing high yielding rice varieties and related technologies to improve productivity in high potential mineral soil rice lands in the Low Country Wet Zone and producing of breeder seeds of recommended “Ld” varieties.

PROGRESS

RESEARCH

Varietal Improvement

Two 3¹/₂ months rice lines (Ld 12-6-22-1-1 and Ld 11-7-3-1) and three 4 months rice lines (Ld 13-8-9, Ld 12-3-4-2 and Ld 12-4-8-2-1) were nominated to CRVT as high yielding lines.

Ten crosses were made and 13 F₁, 5 F₂, 16 F₃ and 5 F₄ generations were advanced. Hundred and six F₅ lines, 82 F₆ lines and 101 F₇ lines were maintained for the development of high yielding adaptable and quality rice varieties for high potential rice lands in LCWZ.

F₄ population of four crosses and 198 lines of F₆ generations of two crosses were advanced at RRS, Labuduwa and at RRS, Bentota respectively. 98 lines were selected for the development of rice varieties for salinity affected flood prone soil conditions.

One hundred and thirty three lines with low thrips infestation were selected from two

crosses where Dahanala was used as donor parent for thrips resistance.

Agronomy and Soil Science

Study was conducted to determine the potential of using Eppawala rock phosphate (ERP) as a substitute for imported triple super phosphate (TSP) under acidic soil condition. Split application of ERP at 88 kg/ha at harrowing and 88 kg/ha as a basal were identified as a suitable dosage which can give comparable yields as TSP.

Suitability of ERP and partially burnt rice husk (PBRH) as a parachute media was determined and found that they were good for use as parachute media.

Three trials were conducted under VAT program involving 6 new rice lines (2¹/₂ months AGT 17, Bg13-1265 and Bg 10-288, 3 months Bw 11-3403 and At 10-1374 and 3¹/₂ months At 10-1350). Among them, AGT 17, Bw 11-3403 and At 10-1350 showed a better adaptability.

Plant Protection

E-pest surveillance and forecasting system was executed to receive rice pest and disease problems from the farmer, to give solutions, to make a data base, to analyze pest populations trends and to make decisions on managing rice pest and diseases with the help of a mobile application “Govi Vedaduru”. Any farmer who gets registered can download the application to upload pest and diseases problems of rice crop. Solution is given to the phone in Sinhala language by expert of the Plant Protection Division in Rice Research Station, Labuduwa.

Rice varieties/lines received under 29th International Rice Bacterial Blight Nursery

were screened for BLB disease and 2 moderately resistant lines were selected.

One hundred fourteen lines and 19 lines were selected respectively from the F₇ generations of Dahanala/Bg 9024 and Dahanala/Bg 300 crosses which were made to develop thrips resistant variety.

Advance breeding rice lines were screened for brown spot disease during Maha 2016/17 and Yala 2017 seasons. Forty five and 117 moderately resistant lines were selected respectively.

BREEDER SEED PRODUCTION

Following amounts of breeder seeds were produced.

Table 1.4.6: Amount of breeder seeds produced

Variety	Seed Quantity (kg)		Total
	Maha 2016/17	Yala 2017	
<u>2½ months</u>			
Ld 253	82	102.5	184.5
<u>3½ months</u>			
Ld 365	41	61.5	102.5
Ld 368	102.5	61.5	164
Ld 371	20.5	41	61.5
<u>4 months</u>			
Ld 408	41	82	123
Total	287	348.5	635.5

TECHNOLOGY DISSEMINATION

- Participated to ‘Haritha Udanaya’ exhibition conducted by Old Boys Association of the Richmond College, Galle.
- Supervised two undergraduate students from university of Sabaragamuwa and

eight agriculture diploma students’ research programs.

- Trained diploma students and undergraduate students for the partial fulfillment of their course.
- Trained school children on rice cultivation and use of climate data.
- Provided solutions to farmers’ field problems related to rice cultivation.
- Workshop on mobile application and web site “Govi Vedaduru” was conducted.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- Training course on Hybrid Rice comprehensive technology for Developing Countries. 10 May - 07 August 2017, Chansha city, China.
- Training course on Hybrid rice seed production technology intensification for developing countries. 27 June - 28 August 2017, Chansha city, China.
- E-Learning Course on ICT- based Services for Agricultural Extension. 27-30 November 2017, National Productivity Secretariat, Colombo.

SPECIAL PROJECTS

Following projects were implemented.

- Establishment of E-pest Surveillance and Forecasting System (NARP funded)
- Development of Rice Varieties for Salinity Affected Flood Prone Soil Condition of Low Country Wet Zone (NARP funded)
- Management of Climate and Soil Related Problems of Acid Sulphate Soils in Paddy Ecosystems

OTHER ACTIVITIES

- Renovation of the fence around the research field and fixing of a new gate.
- Renovation of plant house
- Opening ceremony of new buildings; processing unit and stores, vehicle garage, renovated farm office and staff quarters.
- Maintaining the under-utilized fruit crops.

PLAN FOR 2018

- Hybridization for new crop combination generations and selection of bulk populations to identify promising lines
- Conducting trials of NCRVT and VAT
- production of basic seeds
- Development of pest forecasting model for rice sheath mite in Low Country Wet Zone
- Evaluation of lines selected from the crosses of Dahanala/Bg 9024 and Dahanala/Bg 300 to develop thrips resistant variety
- Evaluation of IRRI rice varieties and lines against BLB
- National Co-ordinated Herbicide Screening (NCHST) Trial for wet-seeded rice
- Conducting experiments and surveys on rice yield limiting soil constraints like Fe toxicity and acidity
- Study of crop models (DSSAT)

RICE RESEARCH STATION – SAMMANTHURAI

The mandate of the station is to cater the research needs of the rice cultivation in the Eastern Province, especially in the Ampara

district and to introduce new rice technologies to increase productivity. The station also has other responsibilities such as producing basic seeds of recommended varieties, conducting NCRVT trials and finding solution to field problems of rice farmers in the region

PROGRESS

RESEARCH

Eight F₆ populations were maintained to select advance rice lines suitable for eastern province.

Fifteen new rice lines belonging to 3 and 3½ month age groups were tested under NCRVT program. At 13-2715 and At 11-1425 lines were found promising.

Three trials were conducted under VAT program involving 6 new rice lines in 6 locations in Ampara district.

Two new entries, Bg 11-802 and Bg 09-1851 were tested in four locations as direct seeded crops. All new entries showed yield superiority over the standard check.

TECHNOLOGY DISSEMINATION

- Information was provided to nearly 286 farmers and diploma holders who visited the station.
- Four training programs were conducted for famers, undergraduates and diploma holders.
- Ten demonstrations were conducted in farmer's fields on seedling broadcasting, machine transplanting and use of pre-emergent herbicides and row seeding.
- Three radio programs were conducted on 'Effective weed management', 'How to

overcome post harvesting losses in paddy' and 'Improvement of soil fertility'.

- Thirty six students from School of Agriculture, 167 School children, 26 agriculture related officers and 346 farmers were trained on paddy cultivation, weed management, water management, pest & disease management, post harvest technologies and organic rice farming

PLAN FOR 2018

- Conducting trials of NCRVT, VAT and Yield Trial
- Conducting NCHST
- Evaluation of drought tolerant and heat tolerant short and ultra short new rice lines
- Investigation of weed control methods in rice cultivation
- Production of basic seeds
- Weedy rice management
- Dissemination of new technologies

RICE RESEARCH STATION – PARANTHAN

The mandate of the station is to cater the research needs of rice cultivation in the Northern region especially in the Kilinochchi, Jaffna and Mullaitivu Districts and to introduce new rice varieties and technologies to increase productivity.

PROGRESS

RESEARCH

Eight new rice lines were tested in 2 trials under NCRVT program during Maha 2016/17 and At 13-1543 (3 months), At 13-3048 (3

months) and At 13-3791 (3½ months) were found promising.

Fourteen new rice lines were tested in 3 trials under NCRVT program during Yala 2017 and At 13-2715 (3 months), Bg 14-567 (3½ months) and Bg 14-509 (3½ months) performed well.

Seven new elite lines were tested in 3 trials under VAT program in Yala season. Bg 13-1265 (3 months) and AERON 9-3 (3½ month) gave higher yields and found to be more adaptable.

A study was conducted by using Bg 352 to find out the optimum plant spacing for mechanically transplanted rice. Spacing of 30 cm X 16 cm was found as the suitable spacing to give optimum plant density. Also 2.1 cm planting depth was found as the best among the tested depths.

Different establishment methods were tested for lowland irrigated rice. Mechanized transplanting and parachute transplanting were found to be more economical and productive when compared with the other methods.

Ten crosses were made and 10 F₁, 6 F₂, 8 F₃ and 7 F₄ generations were advanced. One hundred and thirty breeding lines were maintained.

Ten red pericarped advance breeding rice lines were evaluated and Ld-16-17/Ld 99-12-38 was identified as a promising line.

Feasibility of using motorized weeder was tested in dry drill-seeded rice. It was found that, motorized weeder is not effective in controlling weeds as chemical weeding and hand weeding.

New fertilizer products were tested. CIC sulfonite with organic fertilizer showed good

performance when compared with the other fertilizers tested.

Effect of phosphate solubilizing and nitrogen fixing bio fertilizers were tested. Results indicated that *Azospirillum spp* can be used effectively as a bio fertilizer in rice cultivation.

Six new herbicide products were evaluated under NCHST and Metamifob 10% E and Carfentrazone ethyl were found to be effective than others.

Sixty rice varieties were evaluated for yield performance. Bg 352, Bw 364 and Bg 300 gave highest yields of 6.21, 5.75 and 5.4 t/ha respectively compared to the other tested varieties in respective maturity groups.

Ten lines suitable for aerobic condition were tested under rain-fed and irrigated condition and found that CNI 29 and IRDTN 07-11 were promising under rain fed condition.

BASIC SEED PRODUCTION

Produced 440 kg of seed paddy of traditional rice variety - Moddaikaruppan.

TECHNOLOGY DISSEMINATION

- Nineteen farmer fields in the northern area were inspected and recommendations were given to solve site specific problems on rice.
- Information was provided to about 180 students of schools from Jaffna, Mullaitivu and Kilinochchi Districts who visited the station.
- Facilities were provided to 2 undergraduate students and a post graduate student to carry out their research project.

- Students of School of Agriculture, Paranthan were trained for the partial fulfillment of their course.
- Officers served as resource person in many training programs conducted by DATC, Vaddakachchi, Kilinochchi and trainings conducted by the Central Bank.
- A field day and 3 farmer trainings were held.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- International Conference on Dry Zone Agriculture. 1- 2 November 2017, Faculty of Agriculture, Ariviyalnager, Kilinochchi.

PLAN FOR 2018

- Collection and purification of local land races of rice in northern region
- Development of short to intermediate duration red rice varieties
- Multiplication of traditional varieties
- Agronomic evaluation of machine transplanter in Northern region
- Study to identify reasons for yield gap between researcher and farmer
- Evaluation new rice lines under NCRVT and VAT program
- Screening of herbicides under NCHST
- Production of basic seeds

RICE RESEARCH STATION

– MURUNKAN

The mandate of the station is to cater the research needs of the rice cultivation in the Northern region especially in the Mannar district and to introduce new rice technologies

to increase productivity. The station also has other responsibilities such as conducting National Coordinated trials and finding solution to field problems of rice farmers in the region.

PROGRESS

RESEARCH

Eleven new rice lines were tested in 2 trials under NCRVT program during Maha 2016/17 and Yala seasons. At 13-3791 and Bg 14-567 in 3 months age group and At 13-1543 in 3½ months age group were found as promising lines.

Eighty rice varieties received from IRRI, Philippines were tested in Yala season for their adaptability and yield performances.

Different dosages of Diazinon was tested along with the recommended dosage for rice stem borer. Dosage higher than the recommended dosage performed well in controlling the pest indicating the possible resistance developed in the pest. However, further studies are needed to confirm the results.

Seven Thio-urea herbicides were tested against sedges in rice cultivation and poor performance was observed.

BASIC SEED PRODUCTION

Seventy one kg of seed paddy of variety At 308 was produced.

TECHNOLOGY DISSEMINATION

- Forty five field visits were made by the technical officers to solve regional site specific problems on rice.
- Advice and recommendations were given for about 240 farmers who visited the

station with problems on rice and asked over the telephone.

- Two radio programs were conducted in National Broadcasting Station on rice pest & disease management and weedy rice management.
- Refresher training was conducted to Plant Doctors of North and Eastern provinces under the permanent crop clinic program.
- Three farmer trainings were conducted in Giant tank Irrigation Office, Murunkan.
- Eight seminars were conducted on plant protection for 840 students from Mannar.

PLAN FOR 2018

- Rehabilitation of soil & entomology laboratory with financial assistance of FAO
- Fencing rear of the field
- Rehabilitation of 4 B quarters
- Management of rice thrips through disturbances of egg laying
- Development of a trap for paddy bug
- Study on allelopathic effect of different rice varieties on weeds
- Conducting NCHST
- Conducting NCRVT trials

STAFF LIST

Rice Research & Development Institute, Batalagoda

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	01
Deputy Director of Agriculture	01	01
Assistant Director of Agriculture (Research)	26	13
Assistant Director of Agriculture (Economics)	01	01
Assistant Director of Agriculture (Development)	04	02
Administrative Officer	02	01
Information & Technology Officer	01	01
Program Assistant (Agriculture)	11	04
Development Officer	08	06
Agriculture Instructor	11	17
Research Assistant	45	21
Engineering Assistant	01	01
Public Management Assistant	13	13
Technological Assistant	05	05
Farm Clerk	01	01
Warden	-	01
Driver	10	09
Tractor Operator	03	02
Storeman	01	01
Mechanic	01	01
Technician	01	01
Research Sub Assistant	05	04
Cook	02	02
Circuit Bungalow Keeper	01	01
Lorry Cleaner	-	01
Office Employee	02	02
Watcher	12	09
Laborer (Permanent)	156	120
Laborer (Contract)	51	50
Total	377	293

Rice Research Station, Ambalantota

Designation	No. Approved	No. Existing
Deputy Director of Agriculture (Research)	01	01
Assistant Director of Agriculture (Research)	06	01
Program Assistant (Agriculture)	-	01
Development Officer	02	04
Agriculture Instructor	03	-
Research Assistant	04	05
Public Management Assistant	02	02
Technological Assistant	03	03
Farm Clerk	01	01
Driver	02	02
Tractor Operator	01	01
Research Sub Assistant	02	01
Watcher	04	04
Laborer (Permanent)	42	27
Laborer (Contract)	20	16
Total	93	69

Rice Research Station, Labuduwa

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research) In Charge	01	01
Assistant Director of Agriculture (Research)	05	02
Program Assistant (Agriculture)	-	01
Development Officer	02	03
Agriculture Instructor	02	04
Research Assistant	03	05
Public Management Assistant	02	03
Technological Assistant	01	03
Driver	01	02
Tractor Operator	01	01
Office Employee	01	01
Watcher	04	03
Laborer (Permanent)	24	16
Laborer (Contract)	10	05
Total	57	50

Rice Research Station, Sammanthurai

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	03	01
Assistant Director of Agriculture (Development)	01	01
Development Officer	05	06
Agriculture Instructor	03	01
Research Assistant	03	03
Public Management Assistant	01	02
Technological Assistant	03	03
Driver	02	01
Tractor Operator	01	01
Office Employee	01	01
Watcher	04	05
Laborer (Permanent)	14	10
Laborer (Contract)	10	02
Total	51	37

Rice Research Station, Paranthan

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	03	01
Development Officer	02	02
Agriculture Instructor	01	01
Research Assistant	03	02
Public Management Assistant	02	01
Technological Assistant	06	03
Driver	01	01
Tractor Operator	01	01
Watcher	03	02
Laborer (Permanent)	16	07
Laborer (Contract)	10	10
Total	48	31

Rice Research Station, Murunkan

Designation	No. Approved	No. Existing
Research Assistant	01	01
Technological Assistant	03	02
Watcher	02	02
Laborer (Permanent)	13	09
Laborer (Contract)	04	04
Total	23	18

1.4.1 REGIONAL RICE RESEARCH AND DEVELOPMENT CENTRE (RRRDC) - BOMBUWELA

Regional Rice Research and Development Centre (RRRDC), Bombuwela is one of the stations functioning under the Rice Research and Development Institute (RRDI), Batalagoda. Rice Research Station (RRS) at Bentota is a substation coming under the purview of RRRDC.

The mandate of RRRDC is to develop and disseminate technologies to increase the productivity of rice in Kalutara, Colombo,

Gampaha and part of Galle and Ratnapura districts with special emphasis on paddy fields with problem soils. The Centre is engaged in developing of both red and white pericarp high yielding varieties with tolerance to biotic and abiotic stresses suitable for the area and production of Breeders' seeds of Bw varieties. In addition, it conducts relevant other technology transfer activities.

BUDGET

Table 1.4.1.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	7,164,720	6,529,996	91
Capital	1,427,819	1,365,501	96
Projects			
• Development of reliable screening technique for iron toxicity tolerance in rice (NARP)	493,000	473,989	96
• Role of allelo-chemicals in rice (<i>Oryza sativa</i>) responsible for reproductive maturity of paddy bug	222,400	190,683	86
• Development of site specific fertilizer management system for sustainable rice production	50,000	49,571	99
• Soil testing program for the site specific fertilizer recommendations at Grama Niladari division level	215,000	193,124	90
• Studying the effect of rice storage condition on grain quality	540,000	438,603	81
Total	110,112,939	9,271,607	92

PROGRESS

RESEARCH

Rice Varietal Improvement

RRRDC continued its effort to develop high yielding rice varieties with tolerance to biotic and abiotic stresses specially iron toxicity and submergence. Accordingly, Bw 11-3403 rice line belonging to 3 months maturity group was nominated for VAT. Bw14-509, a rice line belonging to 3½ months maturity group was nominated to NCRVT in Maha 2016/17. Eight advanced breeding lines of 3½ months maturity duration and eight rice lines of 3 months maturity duration were selected through PYT in Yala 2017.

Seeds of elite rice lines, Bw 12-574, Bw 11-3403 and Bw14-509 were multiplied. Seeds of recommended varieties (Bw 351, Bw 400, Bw 451, Bw 452 and Bw 453) and 17 promising rice lines were multiplied.

Agronomy

A study was conducted to evaluate seeding rate and seedling age for yield attributes of mechanical transplanted rice and observed 75 g/ft² seed rate is better. No difference was observed in seedling age.

In NCRVT, 3 months age rice lines, At 13-2715 and At 13-1543 gave higher yield. 3½ months rice lines At 13-3791, Bg 14-567 Ld 11-7-3-1 and Bw performed well.

Zhonghua, AERON 9-3 and Bw 11-3403 performed well under tested condition and farmers preferred them too.

Effect of rice storage condition on grain quality attributes was studied. Different storage

packing materials had differently affected grain quality attributes of selected rice varieties.

Weed Science

The study conducted to determine the weed competitive ability of some selected Bw rice varieties in LCWZ showed that Bw 372 and Bw 361 were most competitive against the weeds.

Pyrasosulfuron Ethyl 10% WP was identified as a new chemical with high efficacy in controlling sedges and broad leaves in LCWZ.

Two recommended herbicides (Azimsulfuron 50% WG and flucetosulfuron 10% WG) were re-evaluated in Yala 2017 and results confirmed that both chemicals were still effective in controlling all weeds.

Pathology

A study was conducted to identify the pathotypes of Bacterial Leaf Blight pathogen (*Xanthomonas oryzae pv oryzae*) and different isolates of pathogen were collected from LCWZ. The pathogenicity was confirmed.

112 rice breeding lines/varieties developed under rice improvement programs were screened for BLB to identify resistant sources and found that none of the tested rice lines was resistant for the disease.

Entomology

In screening of NCRVT rice lines for BPH, two moderately resistant rice lines (At 13-3791 and At 10-1374) were identified.

Sixty eight lines received through INGER program were screened for BPH. Fifteen lines were found as resistant to BPH while 22 lines were identified as moderately resistant.

Study to determine the role of allelo-chemicals in rice on reproductive maturity of paddy bug was continued. Volatile compounds present in different stages of rice plant were extracted separately by following the steam distillation procedure. Bio-assays done with each extract to determine the effective dose that attracts female paddy bugs found that 8 µg of extract per 1 ml of hexane was effective. It was further found that, all the extract contained same constituents but in different concentrations.

Pheromone trap was evaluated against Rice Leaf Folder under field condition at Bombuwela with the aim of recommending eco-friendly pest management method. Forty three adult leaf folders were attracted to a single trap within 6 days indicating its high efficacy in controlling the pest.

Soil Science

The experiment conducted to determine the effect of long term application of different nutrient management system on rice yield and soil properties showed that incorporation of organic matter increased yield and improved the soil chemical properties.

Ten rice varieties were screened with different iron concentrations in Yoshida solution under the controlled environment to develop a reliable screening technique for iron toxicity tolerance in rice.

Water Management

Ten different rice populations having anaerobic germination trait were evaluated to determine the germination and seedling development under field submerged condition. Three

populations were identified with favorable characters.

Three selected rice varieties/lines were evaluated for water seeding under field condition. Rice line NP14-22-1 showed better germination and seedling development under submerged condition.

SEED PRODUCTION

- Following amounts of breeder seeds of recommended rice varieties were produced.

Table 1.4.1.2: Breeder's seeds production

Variety	Quantity (kg)		Total
	Maha 2016/17	Yala 2017	
<u>3½ months</u>			
Bw 364	41.0	20.5	61.5
Bw 361	-	-	-
Bw 367	328.0	307.5	635.5
Bw 372	41.0	61.5	102.5
<u>3 months</u>			
Bw 272-6b	-	20.5	20.5
Total	410.0	410.0	820.0

- 7,356 kg of commercial seeds belonging to 8 rice varieties were produced during the year.

SPECIAL PROJECTS

The following projects were carried out.

- Role of allelo-chemicals in rice (*Oryza sativa*) responsible for reproductive maturity of paddy bug, *Leptocorisa oratorius* (hemiptera: alydidae)
- Development of reliable screening technique for iron toxicity tolerance in rice
- National Food Production Program

- Development of site specific fertilizer management system for sustainable rice production
- Soil testing program for the site specific fertilizer recommendations at Grama Niladari division level
- Studying the effect of rice storage condition on grain quality attributes

TECHNOLOGY DISSEMINATION

- During the year, 2073 soil samples, 64 grain samples, 16 compost samples and 8 plant samples were tested for different parameters.
- Thirty six training programs were conducted on different subjects for extension officers, farmers, teachers, nurses, students in different categories and other interesting groups. The total number of trainees participated was 4373.
- Officers participated as resource persons in 3 field days and 6 exhibitions which were organized by various organizations.
- Officers participated as resource persons in 12 programs/ workshops organized by various organizations.
- A total of 12 internal seminars were conducted by the officers in the Centre.
- Two officers contributed for a live radio program (Subarathi) on organic rice cultivation.
- One field day was held on mechanization of rice cultivation in LCWZ

TRAINING, CONFERENCES & WORKSHOPS ATTENDED

Following trainings, workshops and conferences were attended by the officers.

- Training course on biological control of crop pests and diseases for developing countries. 2017.05.17 to 2017.05.31, Beijing, China.
- Seminar on agriculture biotechnology applications for developing countries. 07.06.2017 - 06.07.2017, Beijing, China.
- Training course on hybrid rice comprehensive technology for developing countries. 10.5.2017 - 07.08.2017, Changsha, China
- Green super hybrid rice variety breeding, seed production and cultivation technology for developing countries. 01.09.2017 - 13.10.2017, Changsha, China
- Rice research to production. 14.08.2017 - 01.09.2017, IRRI, Philippines.
- Hybrid rice seed production technology intensification for developing countries. 28.06.2017 - 26.08.2017, Changsha, China.
- Advanced training workshop for middle level officers. 11.10.2017 - 17.10.2017, RDA, Jeonju, Korea.

PLAN FOR 2018

Rice Varietal Improvement

- Development of rice varieties through conventional breeding technique
- Development of rice varieties for submergence tolerance and iron toxicity tolerance
- Improvement of Bw rice varieties for resistance to BLB

- Morphological and Molecular Screening of selected rice varieties for BLB disease.
- Multiplication of traditional rice varieties
- Breeder seed production

Agronomy

- Evaluation of rice lines under NCRVT and VAT program
- Evaluation of seeding rate and seedling age for yield attributes of mechanically transplanted rice
- Development of reliable screening technique for iron toxicity tolerance in rice
- Identification of suitable Bw rice varieties for mechanical transplanting

Weed Science

- Identification of appropriate time of power weeder application for effective weed control in mechanically transplanted rice
- Evaluation of weed densities and weeds controlling efficiency of mechanically transplanted rice with two seedling rates in nurseries
- Evaluation of herbicides under NCHST program

Pathology

- Screening of breeding rice lines, NCRVT rice lines and INGER rice lines for rice blast disease and bacterial blight disease
- Identification of pathotype diversity of *Xanthomonas oryzae pv oryzae* in LCWZ

Entomology

- Study on natural parasitism of rice stem borers and rice leaf folder in Kalutara District

- Screening of rice lines for resistance to BPH and RGM

Soil Fertility Management

- Evaluation of long term application of nutrient management system for rice grown in LCWZ
- Effect of different Zn application methods on grain yield and grain Zn content of rice
- Evaluation of different types of new fertilizers on rice grown in LCWZ
- Development of site specific fertilizer management system for sustainable rice production
- Soil testing for the site specific fertilizer recommendations at Grama Niladari division level
- Conducting of soil testing program

Water Management

- Evaluation of rice populations having anaerobic germination trait
- Study the effect of water management on weed control with power weeder in mechanically transplanted rice in LCWZ

RICE RESEARCH STATION

BENTOTA

Rice Research Station (RRS), Bentota which is located in LCWZ is a substation of RRRDC, Bombuwala. The major emphasize of the Station is to develop the technologies for rice cultivation in the flood prone and saline areas.

PROGRESS

RESEARCH

A Phosphorus bio fertilizer was developed by growing phosphate solubilizing rhizospheric fungal isolates on a low cost rice husk based growth medium. Yield increase of rice was observed by addition of the bio fertilizer.

Study on shelf life of the bio fertilizer revealed that P solubilizing fungi can survive in the medium for six months at room temperature and shelf life could be extended by keeping the bio fertilizer under refrigerated condition (8 °C).

A study was conducted to identify suitable low cost growth media for mass multiplication of three phosphate solubilizing rhizobacterial isolates isolated from the rice rhizosphere and results revealed that rice porridge and coconut water based media can be used for mass multiplication of phosphate solubilizing rhizobacteria.

A study was conducted to evaluate different rice genotypes for upland cultivation and two introduced rice lines; Aeron 9-3 and Aeron 20-25 were identified as suitable genotypes.

Promising rice lines of different age groups were tested under NCRVT program. Ld 11-7315 performed well under 3½ months age quality rice group. At 13-3048 and At 13-3791 reported the higher yield than the other tested 3½ months age rice lines

SEED PRODUCTION

2,608 kg of commercial seeds belonging to 7 rice varieties were produced during the year.

TECHNOLOGY DISSEMINATION

- Officers participated as resource persons in field days and exhibitions which were organized by various organizations
- Instructions and information were given to the farmers who visited the station

TRAININGS, CONFERENCES & WORKSHOPS ATTENDED

- Training course on hybrid rice comprehensive technology for developing countries. 10.5.2017 - 07.08.2017, Changsha, China.

PLAN FOR 2018

- Evaluation of rice lines under NCRVT and VAT program
- Development of phosphorus and nitrogen bio fertilizer for rice cultivation
- Study on the effect of herbicides on beneficial soil microorganisms
- Testing the suitability of new crops for sorjan cultivation system
- Identification of an effective weed control method for sorjan cultivation system
- Screening of rice lines for submergence and salinity tolerance
- Production of commercial seeds of Bg 455, Bw 372 and Bw 367, Bg 252, Suwadal and Bg 38.

STAFF LIST

RRRDC, Bombuwela

Designation	No. Existing
Deputy Director of Agriculture (Research)	01
Assistant Director of Agriculture (Research)	06
Agriculture Monitoring Officer	02
Program Assistant (Agriculture)	05
Agriculture Instructor	06
Research Assistant	13
Development Assistant	01
Public Management Assistant	06
Farm Clerk	01
Tractor Operator	01
Machine Operator	01
Driver	04
Watcher	04
Laborer (Permanent)	44
Laborer (contract)	13
Total	107

RRS, Bentota

Designation	No. Existing
Assistant Director of Agriculture (Research) In- Charge	01
Development Officer	01
Agriculture Instructor	03
Research Assistant	02
Technological Assistant	03
Public Management Assistant	01
Driver	01
Watcher	01
Laborer (Permanent)	08
Laborer (Contract)	12
Total	33

1.5 NATURAL RESOURCES MANAGEMENT CENTER (NRMC) - PERADENIYA

The Natural Resources Management Centre (NRMC) is mandated to optimize the use of land and water resources on scientific basis to improve national agricultural productivity in a sustainable manner. Changes in land use pattern along with increasing population pressure diminish both the quality and quantity of land and water resources while climate change and its extreme situations are exerting additional pressure on them. These issues are leading to accelerated soil erosion, declining soil fertility, salinization and retardation of water availability for agriculture and deterioration of soil and water. Therefore, development of technologies targeting judicious utilization while conserving

natural resources, particularly land and water resources are a vital task.

Main thrust areas of the Centre are soil conservation and watershed management, land suitability evaluation, agro-meteorology and climate change, geo-informatics and remote sensing, soil & water quality assessments and on-farm & off-farm water management. Main development programs include implementation of the Soil Conservation Act, maintenance of the agro-meteorological observation network of the country, technology dissemination, provision of technical assistance for various development projects both government and non-government organizations and other private individuals.

BUDGET

Table 1.5.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	3,352,649	3,266,354	97
Capital	8,887,000	8,499,519	96
Projects			
• Implementation of Soil Conservation Act	5,000,000	4,964,000	99
• National Agriculture Research Program (NARP)	225,000	220000	98
• National Food Production Program (NFPP)	21,600,000	17,859,000	83
Total	39,064,649	34,808,873	89

PROGRESS

RESEARCH

Issuing of long-term climate forecasts at regular intervals

Weather communiqué were issued at regular intervals in consultation with the Department of

Meteorology (DOM) during the year explaining probable weather conditions on approaching months. This information was made available to relevant stakeholders through online, printed and electronic media as well as via departmental technical circulars to plan and adjust the field activities accordingly.

Development of weather based alert system as a decision making tool for crop management

Sudden weather aberrations of agricultural importance, generated by the DOM were transformed in to agriculturally meaningful text messages which will be delivered to registered users by the NAICC as SMS alerts. .Number of registered users has now exceeded 2,000 from both agriculture and non-agriculture sectors.

Identification of the spatial and temporal potential for off-season cultivation of vegetables, fruit crops and Other Field Crops

Sri Lanka is bestowed with variety of natural resources and one of such blessing is country's agro-ecological diversity. Even though attempts have been made to harness the potential of this diversity for food crop production since ancient times through various means, still there are some regions in the country where adequate attention has not been given to utilize this potential to enhance the agricultural productivity of the country. In addition, present day's changing and variable climate along with accelerated land degradation is also exerting an additional pressure on the food crop production efforts. Therefore, a study was undertaken to enhance the production of other field crops, vegetables and fruits by identifying non-conventional areas and locations where food crops can be cultivated during off seasons to ensure a continuous production of food crops. The climate, soil and terrain characteristics were taken in to consideration to determine the suitability of an area for respective crops.

As a result of the study, 12 new locations have been identified for vegetables, 05 locations for

fruit crops and 19 locations for other field crops. The sites identified for vegetables are Kongahawela, Attapitiya, Hagarapitiya, Salagama, Pattanpitiya, Netiyagane, Lamasooriya, Keerthibandrapura, Pannala, Malsiripura, Diddeniya and Gallewela. New locations for fruit crops are Dombagaslanda, Pallepola, Wasalakotte, Gallewela and Dewahuwa. The sites identified for OFC during off-season cultivation are located in Kahatagasdigiliya, Katiyawa, Ipologama, Athungama, Neeramulla, Labanoruwa, Ekiriyankubura, Wahawa, Nagadeepaya, Pitakubura, Loggal-Oya, Andaulpatha, Embilipitiya, Kolombage-Ara, Eraminiya - (Agunukolapalassa), Udawalawe and Gonnoruwa.

Inter seasonal variability of the rainfall pattern in the Dry Zone of Sri Lanka with the influence of El Nino southern oscillation

A study was undertaken to ascertain the impact of ENSO events on four rainfall seasons of the Dry Zone of Sri Lanka. Daily rainfall time series from 1976-2017 (February) collected from 11 locations scattered in the Dry Zone were used in the study. El Nino and La Nina years during this period was identified using Oceanic Nino Index (ONI) and means of selected rainfall parameters of those years were statistically compared over remaining neutral years. It was clearly evident that there is a strong relationship between El Nino years and reduction of rainfall during FIM season in the Dry Zone. However, there was no clear contrast of FIM rains between La Nina years and neutral years. Even though it is not significant, the occurrence of higher rainfall during El Nino

years in the Dry Zone was evident for the SWM season. A positive anomaly of rainfall was evident in SIM season during El Nino years in the Dry Zone and the opposite was true for La Nina years. The results also revealed an apparent positive anomaly in La Nina years in NEM season while more dryness during El Nino years in NEM season.

Identification of High-Risk Agro-Ecological Regions using Species Distribution Modeling of Priority Invasive Species in Sri Lanka

Mimosa pigra, *Annona glabra*, *Lantana camara*, *Prosopis juliflora* and *Parthenium hysterophorus* are considered as priority invasive plants of Sri Lanka that cause considerable impact on agriculture and food security. The potential areas of these species are not available for land managers for timely control and management measures. This study modelled the suitable climate for these invasive species under current climate scenarios using Maxent model. The study identified highly responding variables for the model prediction of each species. Maxent predictions were overlaid on the agro-ecological map of Sri Lanka and high-risk agro-ecological regions were identified for the five species considered. Resulting maps can be a vital tool for land managers to take information based decisions to control and manage invasive species. The study was completed and a research paper has been published.

Development of National Soil Organic Carbon Map of Sri Lanka using spatial regression modeling techniques

Soil Organic Carbon (SOC) is globally recognized as one of the major Sustainability Indicators. SOC is also important for fertility status of soil since it improves chemical, physical and biological properties. In collaboration with Horticultural Crops Research Institute, SOC map of Sri Lanka was developed under the technical guidance of Asian Soil Partnership to update Global SOC map data with high resolution (30m) SOC distribution map pertaining to Sri Lanka. Secondary spatial data on SOC (322 locations) were gathered from different sources and used as base data for development of SOC map by using regression kriging approach with covariates as Elevation, Normalized Vegetation Index (NDVI), Slope, Monthly average temperature and monthly rainfall. SOC map of Sri Lanka has been developed and further verification and accuracy assessment is scheduled to be completed in 2018.

Identification of drought and high temperature prone agriculture areas and characterize spatial and seasonal agro-ecological environment for adaptive measures

Drought is an insidious hazard of nature. It is often referred to as a "creeping phenomenon" and its impacts vary from region to region. Onset and end of drought is difficult to determine. Two distinguished approaches to dealing with drought conditions are; continuous assessment of drought with dynamic modelling

and demarcating drought prone areas based on historical drought condition trends and frequency. This research mainly focussed on drought prone area mapping using crop condition assessment based on vegetation indices derived from remote sensing satellite data. Time series MODIS free satellite data for 16 years (2001 to 2016) were used for drought frequency assessment and mapping of drought prone areas. Drought prone area map of Sri Lanka was developed and final validation is in progress. The study is a part of FCRDI project "Ensuring Food Security through Developing Climate Smart Crop Varieties and Cultivation Technologies in Sri Lanka" funded by National Research Council (NRC). The project will continue for 2018.

Evaluation and monitoring Food Production National Program through GIS approaches at GN division level

Food Production National Program is a national wide program launched by Ministry of Agriculture in coordination with Presidential Secretariat targeting at saving foreign exchange by minimizing food imports, for items that can be cultivated within Sri Lanka and targeting to achieve national food requirement through year round production. Mapping of food production target on arable land categories at GN division level has been completed for Badula, Hambanthota, Kegalle, Nuwara Eliya, Polonnaruwa and Batticaloa districts.

Identification of suitable paddy lands within major irrigation schemes for seasonal crop diversification

Field investigations were carried out to identify paddy lands under major schemes which have the potential for crop diversification. Cultivation of other field crops (OFC) in paddy fields under water limiting cropping seasons is a promising approach for increasing land productivity and thereby enhance farmer's income. Detailed soil surveys and drainage assessments were completed in paddy tracts in Polonnaruwa district within New Town DS division in Parakrama Samudraya Irrigation Scheme and maps showing crop suitability classes have been developed. OFC cultivation demonstrations in identified lands are to be established and the research is continuing in collaboration with the Irrigation Department for 2018.

Assessment, characterize and mapping soil erosion hazards in Dry Zone

Spatial information on erosion hazard in Dry Zone is limited and the main aim of this study was to develop an erosion hazard map for the Dry Zone using the Universal Soil Loss Equation (USLE) under GIS environment. Erosion factor maps for whole Sri Lanka has been developed for ; Soil Erodibility (K) using soil map and erodibility values already published in literature; Slope (SL) factor map using ASTER GDEM (30m) satellite elevation data acquired from NASA web site; Management Factor (P) Map using 1:50000 digital land-use map assigning management factors published for each land-use classes; vegetation cover (C) Factor using Land Sat

(30m) 2015 satellite data by deriving NDVI and C factor modelling and Erosivity map was derived using annual rainfall with pre-tested equations. Erosion hazard map was developed and accuracy testing and map validation is scheduled to be completed in 2018.

Soil Erosion hazard assessments and their usage in land use planning; Sabaragamuwa Province

Soil erosion is a major land related problem in Sri Lanka. Assessment of soil erosion and identifying hot spots is needed for prioritizing soil conservation interventions. Although soil erosion assessment for Central and Uva have been completed, there was no proper assessment done for Sabaragamuwa Province. Hence, the objectives of this research were to assess soil erosion hazard, and utilize the information for regional scale land use planning within Sabaragamuwa Province. Geo special technology and universal soil loss equation (USLE) was used for soil erosion assessment. USLE input parameters were spatially analysed and the erosion hazard map was derived. Accuracy assessment of the erosion hazard map was done by using field observations and questioner survey by using field staff in the Sabaragamuwa Provincial Department of Agriculture and farmer interviews. The results show 61% of land area is within extremely high and very high erosion hazard class. These high erosion prone areas need to be used with perennial systems, thus proneness to erosion can be minimized. In the same time, areas falling within less erosion prone classes can be utilized for annual cropping. Thus erosion hazard map is can be effectively used for regional scale land use planning aiming at minimizing soil erosion. This project was

completed and the research paper is ready for publication.

Web GIS Portal for agricultural information dissemination

The development of a Web-based system by integrating GIS and Database Management System (DBMS) allow the user to operate the system without having to understand with the underlying intricacies of GIS and DBMS technologies. Moreover, it would allow sharing of spatial information and technical expertise among users. The objective of this project is to develop web-based interactive information and mapping portal for exploring data, information retrieval, visualizing and printing of maps related to agricultural resource potential. Open source QGIS software was used to generate this web portal. As a trial web GIS platform was created from Arc-GIS account and platform was linked to DOA website. (www.agridept.gov.lk/crop_suitability/, webGIS platform). In addition, this web platform will be linked to the National Spatial Digital Infrastructure (NSDI) platform ICT Agency of Sri Lanka.

Identify the anomalies in rainfall intensity to revitalize erosivity map and soil erosion hazard maps in Sri Lanka

Understanding climate change and its impacts on land is vital for land and water resources management. In Sri Lankan context, it is reported that the rainfall pattern is changing and it is apparent as an increase in extreme rainfall events, but with no significant difference in rainfall annual totals. Under the above situation, one can expect higher rainfall

intensities during rains. Therefore, it is a timely requirement to identify the changes in soil erosive power of rainfall and update the rainfall erosivity map as it was not updated since 1989. Therefore, the objectives of this project are; to update rainfall erosivity map with present changes of soil erosive power of rainfall, compare of rainfall erosivity during 1980s with present values and identify the changes in soil erosion against existing rainfall intensity in Sri Lanka. The 20 years of rainfall data representing 18 agro-met stations were obtained and analysis is being done using modified Fournier index method. The study is being continued.

Development of sustainable fertility management strategies (Physical, chemical and biological) for major crop growing environments in Sri Lanka

A field survey was initiated in 2016 and continued in 2017 to identify existing soil fertility problems in major food production farming systems in all administrative district in Sri Lanka. Soil samples, water samples from surface and ground water and farmer's perspectives were collected from each farming system for development of sustainable fertility management strategies (Physical, chemical and biological). During 2016 and 2017, information was gathered from 33 farming systems in 14 districts (Anuradapura, Badulla, Colombo, Galle, Gampaha, Kalutara, Kandy, Kegalle, Kurunegala, Matale, Matara, Nuwara Eliya, Puttalam and Ratnapura). Sustainable fertility management strategies developed were; providing adequate soluble salt leaching in waterlog areas to restore salt affected

situations, adoption of soil and moisture conservation practices for rain-fed lands, adoption of appropriate irrigation practice based on groundwater quality for agro-wells based farming systems, recycling of rice straw in addition to continuation of recommended fertilizer application, application of efficient on farm irrigation techniques, Establishment of sea water intrusion and flood protection barriers, cultivation of appropriate rice varieties resistant to existing soil problems, adoption of efficient irrigation practices for OFC grown in Yala season on paddy lands, cultivation of appropriate rice varieties resistant to existing soil problems, apply chemical fertilizer with frequent splits in order to control nutrient leaching in sandy soils and frequent wetting of soil surface in order to control temperature rise on coastal Regosols. This research will be continued in 2018 in order to cover remaining districts in the country.

Monitoring water quality of major streams in central highlands in Sri Lanka to identify critical watersheds for conservation

A study was commenced in September 2014 and continued since then in the upper catchment of the Mahaweli river basin by selecting 9 locations in the main river and 16 locations from its selected tributaries. Monthly water samples were collected and tested for pH, EC and turbidity at Natural Resources Management Center, Department of Agriculture, Peradeniya. Results showed that a 34 % of 900 water samples tested both in tributaries and in the main river has exceeded the permissible level of turbidity (8 NTU) for drinking purpose, and 69 % of water samples

were in the alkaline range, exceeding pH 7.0 and 88 % of samples showed low salinity (< 0.25 dS/m) status. Further, mean monthly turbidity was relatively higher during the first 8 months of the year in the main river compared to tributaries and the mean turbidity during the study period was 17 and 12 NTU in the main river and the tributaries, respectively. In contrast, mean monthly pH was relatively higher in first 9 months of the year and mean monthly EC was relatively higher throughout the year in the tributaries compared to the main river except during the month of December. The mean pH during the study period was 6.9 and 7.2 and the EC was 0.083 and 0.109 dS/m in the main river and the tributaries, respectively. This study reveals that physical clarity of water is severely affected by direct disposal or wash of soil from urban areas compared to the contribution from agricultural land uses. Further, with respect to salinity, alkalinity and dissolved solids, water purity has been satisfactory in the main river and in tributaries as well. This research will be continued in 2018 for understanding long-term trends of water quality.

Soil and water conservation for enhancing biodiversity in farming systems and adaptation to climate change

An on-farm pilot study was initiated in 2014 and continued since then to demonstrate the importance of conservation of soil and water resources in farming systems. The selected farming systems were Kandyan forest gardens in the Ududumbara area (Mid Country Intermediate Zone), Home gardens and rain-fed uplands in the Giribawa area (Low Country

Dry Zone) and Ovita lands and home gardens in the Milleniya area (Low Country Wet Zone). Samples from surface soil, surface water and ground water were collected to determine resource quality. In addition, 10 field demonstrations were established in 2016 and 2017 to make farmers aware of technologies suitable for soil and water conservation in different villages namely, Kalugala, Padupola, Gampola, Wannikudawewa, Pahala Giribawa and Bellanthudawa. Seven field days were organized during past two years and expected to continue such activities in 2018 as well. In addition, a chart based on field observations was developed for soil fertility assessment in farming lands and farmers would be able to assess the soil fertility status of their farmland using these charts.

Increasing water productivity under agro-well farming systems

A study was initiated in 2016 with the objective of identifying the present status of irrigation methods utilized under agro well system and to assess farmer adoption levels of water saving methods. The study was carried out in rainfed uplands under agro well farming systems in Anuradhapura district (Thirappane, Ipologama, Anuradhapura and Kahatagasdiliya) using a structured questionnaire. Based on survey results knowledge gaps of farmers in irrigation management were identified and farmer trainings were organized to strengthen their capabilities in irrigation management. In 2017, sixty three selected farmers from North Central Province and 18 farmers in North Western Province were trained and sprinkler kits suitable for 0.25 ac were distributed and 200

government officers were trained. The remaining tasks will be completed during 2018.

Assessment of catchment scale soil erosion using nuclear techniques

Under the present context of climate change, status of soil erosion under different land uses need to be studied as the validity past information is meagre under the said context. Hence, existing recommendations for soil conservation measures need to be revisited and updating such recommendations is a timely need. Therefore, a proper assessment of soil erosion under different land uses on micro-watershed basis is a prerequisite for updating of soil erosion control technologies. Assessment of soil erosion in selected watersheds in Ibbagamuwa in Kurunegala district and Painedikulama in Anuradhapura district were done using radio isotopes of ^{137}Cs and ^{210}Pb . Samples are being analysed at Atomic Energy Board Colombo. This study will continue during 2018.

Implementation of Soil Conservation Act (SC Act)

Responsibility of the implementation of the SC Act is vested with the NRMC on behalf of the Director General of Agriculture. Activities under this were implemented through the collaboration of Provincial Departments of Agriculture. During the year Central, Sabaragamuwa and Uva Provincial Departments of Agriculture were allocated approximately 1.5 Mn rupees for each. Appropriate soil conservation measures / structures were established in micro water-shed based farmer fields. Within the conservation area it has promoted to conserve micro

catchments rather than establishing individual demonstrations. The programme covered 130 acres farmer fields in all seven districts. In addition to the conserved micro watersheds 12 individual demonstrations were established in the Sabaragamuwa Province. Though the unexpected weather condition caused posed an adverse impact on soil conservation activities during the year, it could be achieved more than 90% of physical progress. Overall financial progress achieved was 95% against to the total allocated funds for implementation of Soil Conservation Act.

Maize cultivating lands in dry zone (Anuradhapura, Polonnaruwa & Monaragala IP) were successfully conserved by establishing soil conservation bunds. 150 acres were conserved in this year as a pilot project under the National Food Production Program.

Establishment of a Sub Unit for natural resources management at Kundasale

Sub unit of the Natural Resources Management Centre at Kundasale was declared open in 2017 with the blessing of Hon. Minister of Agriculture Mr. Duminda Dissanayake and the Director General of Agriculture Dr. Rohan Wijekoon. The NRMC sub unit consisted with "Soil Conservation Knowledge Centre" (SCKC) and "Natural Resources Research and Soil Conservation Demonstration Site" (NRMDS).

SCKC and NRMDS is jointly serves as a national learning and knowledge sharing centre for farmers, school and university students and teachers, government and private sector officers, extension and research personnel and any interested parties on upstream and downstream conservation techniques.

SC implementation in DOA owned seed production farms

Soil conservation planning and implementation in DOA owned seed production farms, research farms and ISTI were successfully done in this year. Rs 3 million was allocated to conserve government seed farms. Seetha Eliya, Meepilimana and Kundasale seed farms were conserved under this programme & achieved 100% physical as well as financial progress.

Roadside Boards

Roadside boards depicting the importance of Soil Conservation and its legal provisions appear to be an effective mode to increase awareness among general public. Therefore, 5 roadside boards (Toppass, Ella, Dunhinda, Rosalla & Ulapane) were renewed with newly designed sticker which was having a meaningful design on soil conservation.

Training and awareness programs on Land and Water Resource management

Training programs

- A special four-day training program was conducted for Land use Policy Planning Department officers on soil conservation and land development. Program was conducted at the ISTI, Gannoruwa and thirty one officers were trained.
- Six two-day programs were conducted for the officers of the Uva Province at In-service Training Institute, Bindunuwewa,
- Training programs for Agriculture Instructors were conducted for Matara District in District Training Center, Thelijjawila, Moneragala district at District

Training Center, Bibile, for Uva Provincial field officers

- Leader farmers at Diyaluma, Nikapotaha village,
- National Vocational Qualification students at District Training Center, Nawayalatenna.
- Altogether 130 officers and 34 National Vocational Students were trained on soil conservation and land development with awareness of the Soil Conservation Act.
- Conducted six, one day programs on soil and water conservation at Perawatta, Kolabissa, Panwiala, Welikada in Hanguranketha, Pitawala and Waththegama for field officers and selected farmers of the Mahaweli Authority.(Altogether 246 were trained)
- Conducted 14 field training programs on soil and water conservation for Maize farmers at Anuradhapura, Kahatagasdigiliya, Ipalogama, Thirappane, and Hingurakgoda, Medirigiriya in Polonnaruwa under National Agriculture Production Program (252 farmers were trained)
- Conducted two programs on soil profile, soils types and soil and water conservation for Agriculture School students at Karapincha and Bibile. (87 students participated)
- Conducted two programs on soil profile description, soil and water conservation for University students (94 students participated)
- Kalutara district technical officers (52) were trained on land development and soil conservation at ISTI, Bobuwela.
- Two trainings were conducted at Watakele on soil conservation for 78 selected farmers.

- A special training was conducted for fourteen NRMC officers at Kundasale soil conservation training unit.
- Three trainings were conducted for trainers at Wayamba Province on Soil conservation and sustainable land management. (103 officers were participated)
- Conducted special field training on soil conservation and land development at Agrarian training center, Pilimalalawa for 18 officers and agrarian agents.
- A training program was conducted on soil conservation and soil conservation act for eight officers and 30 selected farmers at Deltota collaboration with Land use policy planning department.
- Soil conservation awareness was conducted at Karadawatta, Bulathkohupitiya for 30 selected farmers.

Workshops

- World environmental day seminar was held on the theme of “Conserve soil for environmental sustainability” at Auditorium, Department of Agriculture, Peradeniya with collaboration of “Haritha Kawayaya” of DOA. (Ninety eight (98) officers were participated.)
- Two awareness seminars were conducted on soil and water conservation at Gurudeniya teachers training center, and SANASA center, Kegalle, with collaboration of the Ministry of environment. (participated 297 teachers)
- A special seminar was conducted at the BMICH, Colombo on importance of soil and water conservation with collaboration of the Ministry of Environment. Four hundred and fifty teachers and students were participated.

- World soil day celebration “Caring for the Planet starts from the Ground,” was held at Ruwanpura, Hatton with collaboration of the Provincial Agricultural Department. (Participated 75 officers and 100 farmers)

Exhibitions

NRMC Officers were engaged in technology dissemination activities at the following exhibitions.

- Technical exhibition, Walala Central College, Walala.
- Agriculture and environmental exhibition, Madeena Central College, Waththegama.
- Agriculture and environmental exhibition, Pushpadana Vidyalaya, Kandy.

Printed Materials

Following printed materials were prepared and produced.

- 10,000 of Soil and water conservation field hand books

Radio Programs

Officers of the NRMC participated five programs on soil conservation, climate change and related environmental issues broadcasted at Rangiri Dambulu service, Kandurata service, and Colombo radio service. Further they have participated in three television programs on soil conservation, climate change and other related issues.

Technical Assistance

One of the main activities of the center is provide technical assistance and expertise knowledge on different development activities. Following technical assistances were provided during the year, 2017.

- Development of Grama Niladari (GN) division level Paddy land distribution maps and grid sampling scheme for HORDI to facilitate conducting Island wide fertility survey.
- Socio Economic and Planning Center (SEPC) for development of Agriculture Instructor range map of Sri Lanka
- Collaborated with Wayamba University of Sri Lanka for development of potential distribution map of Cashew in Sri Lanka
- Preparation of paddy land extent statistics based on 1:50000 topo maps for Ministry of Agriculture
- Technical assistance for establishment of soil and water conservation measures in Dharmaraja Vidyalaya in fruit cultivation land.
- Technical assistance for establishment of soil and water conservation measures at Government agent division, Deltota under National tree planting program.
- Estimate preparation and technical guidance for establishment of soil and water conservation measures at Agrarian Training Center, Pilimalawa. .
- Served as a Governing Board Member, SAARC Agriculture Centre, Dhaka, Bangladesh
- Served in National Steering Committee on Climate Change Adaptation, Ministry of Mahaweli and Environment
- Served in National Steering Committee on Climate Change and Natural Disasters, National Science Foundation
- Served in National Committee on Natural Resources Management, Sri Lanka Council for Agriculture Research Policies (SLCARP)

PLAN FOR 2018

Research

- Seasonal climate forecasting at agro-climatological zone based, in collaboration with the Department of Meteorology
 - Development of weather based alert system as a decision making tool for crop management
 - Inter-seasonal variability of the Rainfall pattern in the Wet and Intermediate Zones of Sri Lanka under the influence of El nino Southern Oscillation.
 - Identification of the temperature variations with the influence of Climate Change (after 2010) compared to the long term average in major paddy growing areas.
 - Accuracy assessment and finalizing Soil Organic Carbon map of Sri Lanka.
 - Development of guidelines for extraction of shallow ground water.
 - Development of isohyetal maps of onset of seasonal rains and length for Sri Lanka.
 - Farmers' perception of climate smart agricultural technologies.
- Representation in Technical Committees**
- Served as a Member of the National Expert Committee on Climate Change Adaptation. Ministry of Environment, Sri Lanka
 - Served as a Technical Advisor to the project on Community Based Adaptation to Climate Change in Sri Lanka. United Nations Development Program (UNDP), Sri Lanka

- Farmers' perception towards climate change effect on fruit cultivation in some districts with different agro-ecologies in Sri Lanka-DL1.
- Study on impacts of changing climate on flowering of Rambutan.
- Study the behavioral changes of reproductive and productivity parameters of major fruit crops, under changing and variable climate. Collaboration with FCRDI
- Identification of potential crop diversification lands in major irrigation schemes.
- Development of web based agriculture information system.
- Assessment of eco system services of natural eco systems agricultural eco systems of three pilot sites of Giribawa, Kalugala and Millaniya.
- Wet and dry aggregate stability of different soil series under different land uses and correlation between different soil physical and chemical parameters.
- Watershed based soil erosion assessment using nuclear techniques in Kandy district.
- Assessment of biophysical and socioeconomic constraints faced by farmers on paddy land abandonment in Gampaha and Galle districts and exploration of potential interventions.
- Study the potential of rain water harvesting ponds to enhance the efficiency of crop production in rain fed upland cultivation in Dry Zone.
- Rainfall intensity duration frequency studies.
- Monitoring water quality of Mahaweli river.
- Strengthening and maintenance of nation agro-met Weather observation network and its database.
- Soil conservation and storm water management guidance for environment impact assessment projects in collaboration with CEA.
- Implementation of soil conservation Act in collaboration with Provincial department of agriculture and other implementing agencies

STAFF LIST

NRMC, Peradeniya

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	01
Principal Scientist	03	02
Deputy Director	06	01
Assistant Director of Agriculture (Research)	25	05
Assistant Director of Agriculture (Development)	05	03
Administrative Officer	01	01
Program Assistant (Agriculture)	04	02
Development Officer	06	05

Designation	No. Approved	No. Existing
Soil Surveyor	05	03
Agriculture Instructor	07	13
Research Assistant	07	02
Public Management Assistant	07	07
Technological Assistant	01	01
Driver	07	07
Storeman	01	01
Research Sub Assistant	02	02
Office Employee	01	02
Watcher	03	03
Laborer	09	08
Laborer (Contract)	05	03
Total	55	52

NRMC Sub Unit, Kundasale

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Development)	02	-
Agricultural Instructor	02	01
Public Management Assistant	03	-
Farm Manager	02	-
Driver	01	-
Storeman	01	-
Office Employee	01	-
Watcher	04	-
Laborer	01	-
Laborer (Contract)	15	03
Total	32	03

2.1. SEED CERTIFICATION AND PLANT PROTECTION CENTRE (SCPPC) - GANNORUWA

The mandatory task of Seed Certification & Plant Protection Centre (SCPPC) comprises the protection of agriculture sector in the country by preventing entry of alien pests; promoting environmentally friendly, technically feasible and economically viable pest management strategies; ensuring the availability of appropriate quality pesticides for pest control; assuring safe use of pesticides; promoting seed industry to assure the availability of quality seeds; conserving of genetic resources of food crops and supporting their utilization.

The above functions are performed by five main units of SCPPC, namely: National Plant Quarantine Service (NPQS), Plant Protection Service (PPS), Office of the Registrar of

Pesticides (ROP), Seed Certification Service (SCS) and Plant Genetic Resources Centre (PGRC). The SCPPC has been functioning as a regulatory overseer pertaining to the following Acts.

- Plant Protection Act No. 35 of 1999 to protect the local agriculture and promote effective pest management strategies with the least harm to the environment.
- Control of Pesticides Act No. 33 of 1980 to ensure availability of high quality pesticides with the least hazard to human health and the environment.
- Seed Act No. 22 of 2003 to safeguard the farmers as well as the seed handlers from malpractices that would harm the seed industry.

BUDGET

Allocations received and expenditure incurred by the SCPPC under recurrent and capital votes are given in Table 2.1.1 below.

Table 2.1.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	60,119,674	52,689,811	88
Capital	42,277,151	41,511,284	98
Total	102,396,825	94,201,095	93

PROGRESS

Regulatory Activities

New Regulations of Plant Protection Act No. 35 of 1999

Comments on the draft regulations of the Plant Protection Act No. 35 of 1999 were received

from the Legal Draftsman's Department in early 2017. Up on the receipts of comments and suggestions, eight workshops were held with relevant Officials of the Department of Agriculture (DOA) to discuss and finalize the regulations subsequently, comments and suggestions agreed upon during workshops and meetings were incorporated into the draft

regulations in all three languages: Sinhala, Tamil and English and were submitted to the Legal Draftsman's Department through the Ministry of Agriculture.

Draft Regulations of Seed Act No. 22 of 2003

Preparation of new regulations of Seed Act No. 22 of 2003 in Sinhala and English languages were completed and the draft was submitted to the Legal Draftsman's Department for legal scrutiny in 2016 and the Tamil version was submitted in 2017.

One workshop was held with relevant officers to update the seed standards.

Staff information system for SCPPC

There are five major institutes which operate under the directorate of the Seed Certification and Plant Protection Center. There are 850 employees currently working under the SCPPC. There is a need to gather employee information for different purposes and some requests come at short notice. Manual collection of data is time consuming and liable for human error. Therefore, an effective web-based system to store all staff details such as number of employees currently working in each division, their job role, working history and qualifications etc. was prepared. Primary testing of web-based system was completed. The work on gathering employees' information from all the institutes coming under the SCPPC is in progress.

e-Phyto Online Permit Issuing System

A national generic system for Sri Lanka to access e-phyto global web hub for issuing

phytosanitary certificates through online and information sharing mechanism with other countries is being developed in collaboration with the IPPC, UNICC and the Australian Government Department of Agriculture. This system has thematic linkages with current activities of the National Plant Quarantine Service (NPQS) & its sub units. During the implementation phase, the system administration (i.e. technical management) of this project will be under taken by the SCPPC.

Information System on Permanent Crop Clinic Program

The permanent crop clinic program is conducted by the Plant Protection Service in collaboration with the SCPPC. Information of crop clinics records, farmer details, crop diagnosis details are entered into a web-based system, developed for desktop PC and Mobile (Android) versions. This is useful to get report and analyze the information of crop clinic details. Currently, we are working with this project: data management and data analysis.

Officer's Scholarship Information System

This system is also a web based system which support to manage the scholarship details of the officers attached to SCPPC and its subunits.

Seminars / Awareness Programs / Trainings

A technical officer in SCPPC served as a resource person in seven awareness programs on Plant Protection Act and Plant Quarantine.

There were one hundred and sixty authorized officers in Agriculture and Irrigation

Departments and ninety officers in Police Department as trainees.

Four thousand three hundred and sixty five (4,365) import permits have been issued

during 2017 by the NPQS. The following tables indicate the quantities of vegetable and fruit seeds, imported during 2017.

Table 2.1.2: Total Quantity of Vegetable Seeds Imported via Sea Port and Air Port in 2017

#	Crop	Quantity (kg)			#	Crop	Quantity (kg)		
		Sea Port	Air Port	Total			Sea Port	Air Port	Total
1	Bean	113,400.0	0.01	113,400.1	15	Luffa	4,135.7	75.5	4,211.2
2	Beet	15,570.8	1,510.1	17,080.9	16	Drumstick (Moringa)	-	209.0	209.0
3	Bitter gourd	3,200.9	71.3	3,272.2	17	Okra	2,191.5	8,280.9	10,472.4
4	Broccoli	10.0	0.0	10.0	18	Packchoi	30.0	40.0	70.0
5	Cabbage/ Chinese Cabbage	1,168.7	964.1	2,132.9	19	Sweet pepper/Bell pepper etc.	5.4	0.6	6.1
6	Carrot	39,740.6	235.1	39,975.7	20	Hot Pepper/ Capsicum/ Chili/ Pepper	5,066.0	784.2	5,850.1
7	Cauliflower	112.0	100.3	212.3	21	Pumpkin/ Pumpkin (Batana)	21,216.4	745.3	21,961.6
8	Celery	17.5	-	17.5	22	Big Onion	4,200.0	2,500.0	6,700.0
9	Chinese kale	272.3	-	272.3	23	Red Onion	-	1,250.0	1,250.0
10	Cucumber	2,031.0	730.4	2,761.4	24	Radish/ Chinese Radish	9,804.5	305.1	10,109.5
11	Eggplant (Brinjal)	517.1	-	517.1	25	Squash	255.0	70.0	325.0
12	Knol khol (Kholrabi)	930.0	625.1	1,555.1	26	Tomato	957.2	130.8	1,087.9
13	Leek	12,502.2	0.0	12,502.2	27	Upland Kang Kung	1,033.0	-	1,033.0
14	Lettuce	278.4	4.7	283.1	28	Yard Long Bean	4,344.6	0.1	4,344.7

Table 2.1.3: Total Quantity of Fruits and Other Seeds Imported via Sea Port and Air Port in 2017

#	Crop	Quantity (kg)			#	Crop	Quantity (kg)		
		Sea Port	Air Port	Total			Sea Port	Air Port	Total
1	Papaya	1.20	6.1	7.3	6	Sweet Corn	412.0	100.0	512.0
2	Water Melon	9,151.0	748.1	9,899.1	7	Maize (Corn)	1,324,581.3	54.0	1,324,635.3
3	Seed Potato	1,602,340.2	-	1,602,340.2	8	Flower Seeds	0.1	113.0	113.1
4	Melon	10.00	-	10.00	9	Grass Seeds	925.0	-	925.0
5	Sorghum	28,000.0	-	28,000.0	10	Sorghum (Fodder)	-	300.0	300.0

PLAN FOR 2018

- Implementing relevant regulations to facilitate safe and effective handling of seeds, plants, planting materials and agrochemicals which will enhance the contribution from agriculture to Gross Domestic Product (GDP).
- After obtaining the approval from the Legal Draftsman's Department, actions will be taken to gazette the regulations of the Plant Protection Act No. 35 of 1999.
- Actions will be taken to gazette the Regulations of the Seed Act No. 22 of 2003
- Coordination of activities in control of invasive alien species (IAS) in Sri Lanka through the IAS cell based in SCPPC
- Develop a database on label information issuing under the Seed Act No. 22 of 2003
- Develop an official website for Provincial Department of Agriculture, Uva Province
- Monitoring of technical progress of all the institutes under the administration of SCPPC
- Promote safe use of pesticides
- Formulating appropriate plans and policy decisions related to the production of high quality seeds and planting materials.
 - Upgrading the seed enterprise in the country
 - Development of good quality planting material production in the country
 - Strengthening national plant health system.
 - Harmonization of regulatory measures
 - Promoting the most effective and safe pest control strategies in agriculture
 - Evaluation of the official control system of export of plants and plant products to the countries concerned.
 - Development of farm certification scheme in order to address the concerns of plant quarantine requirements on fruits and vegetables.

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	-
Assistant Director of Agriculture (Development)	05	02
Administrative Officer	01	-
Information & Communication Technology Officer	-	01
Program Assistant (Agriculture)	04	01
Development Officer	04	03
Agriculture Instructor	01	01
Public Management Assistant	12	09
Driver	04	03
Office Employee	02	02
Laborer	05	07
Laborer (Contract)	02	02
Total	42	32

2.1.1 SEED CERTIFICATION SERVICE (SCS) - GANNORUWA

The Seed Certification Service (SCS) performs regulatory functions pertaining to assuring the quality of seeds and planting materials available to farmers.

Responsibilities:

- Implementation of the Seed Act No. 22 of 2003.
- Certification of the quality of basic seeds of rice, vegetables, other field crops (OFCs), potato and planting materials before multiplication.
- Certification of the quality of commercial seeds of Rice, Vegetables, OFCs, Potatoes and planting materials.
- Fruit plant certification and fruit plant nursery registration
- Selection and registration of suitable Fruit Mother Plants (FMP).
- Laboratory testing of local and imported seeds for germination, viability, purity and moisture
- Post-control grow out trials for imported and locally produced seeds to evaluate the quality.
- Conducting tests on Distinctness, Uniformity and Stability (DUS), prior to release of new crop varieties
- Conducting seed health testing.
- Training and awareness for seed growers, nurserymen, seedmen and Officers on quality seed and planting material production in relation to the Seed Act.
- Find out solutions to overcome field problems on quality seed and planting material production by conducting applied seed technology research programs.
- Seed quality development and promotion activities.
- Quality assurance of storage seed lots by testing and lot breaking
- Denominations of imported vegetable and OFC seeds prior to marketing.
- Database management and monitoring.
- Publishing Fruit Nurserymen Directory, annually and Seed Producer's Directory, seasonally.

BUDGET

Allocations received and expenditure incurred under different votes and projects are given in Table 2.1.1.1.

Table 2.1.1.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	20,526,562	18,670,705	91
Capital	17,245,000	19,414,067	113
Projects			
• Seed Act	15,000,000	14,991,840	100

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• AFACI (Collaboration in the construction of epidemiology information interchange system for migratory diseases and insect pests in Asia region (IPM))	4,832,000	4,770,000	99
• Farm Division (vote 1504)	5,000,000	4,749,200	95
• National Food Production Program	4,000,000	3,980,902	100
Total	66,603,562	66,576,714	100

PROGRESS

- Inspected 4,676 ha of rice, 1,900 ha of OFC, 156 ha of vegetables and fruits and 77 ha of potato fields cultivated for seed production.
- Tested 15,428 seed samples representing 12,739 mt of seed paddy, 1,573 mt of OFC seeds 48 mt of vegetable seeds and 701 mt of seed potatoes and 1,087,416 mini tubers.
- The registered extent of seed paddy was decreased by 23% while the registered extent of OFC was increased by 174% in 2017 when compared to 2016. The extent of vegetables was also increased by 77% during the year.
- The quantity of seed paddy production was relatively lower by 11% in parallel with the decrease in extent of cultivation. The quantities of OFC and vegetables were increased by 164% and 67%, respectively compared to the production in 2016.
- 324 horticulture nurseries producing certified planting materials were registered following quality inspections. The quality of 577,777 grafted fruit plants were certified by labeling.
- 586 mother plants were selected, certified and labeled as quality plant stocks.
- Evaluated 11 rice, 15 OFC, 6 vegetables and 1 fruit variety and 2 parental lines under DUS testing program.
- Tested 830 post control samples of rice, OFC, vegetable and potato in PC 1- PC VI situated at Gannoruwa, Seetha Eliya, Bata-atha, Karadiyanaru and Maha Iluppallama.
- 149 imported vegetable samples were tested.
- Lot breaking from vegetable and OFC seed bulk of storages respectively 2,518 and 3,653.
- 1,064 emergency seed paddy samples, which represent quantity of 5,540 mt and 789 samples (4,803 mt) were accepted. OFC sampled number of 161 and quantity of 62.7mt which all are accepted.
- Seed health testing was introduced to seed quality assurance system and 152 samples were tested in seed health testing laboratory.
- Registered 917 and renewed 890 seed handlers under the Seed Act.

- Granted approval for 160 labels used by different seed and planting material producers under the Seed Act.
- Handled 21 inquiries related to the Seed Act.
- 262 premises were inspected for facilitating the proper channel of seed marketing.
- The National Seed Council was established and the first Committee meeting was held on 2017.11.29.
- 5,606 government and private sector officers, nurserymen, seed farmers and seed handlers were trained on the Seed Act and seed production activities
- A field day was held for the Officers of the Department of Agriculture (DOA) at the Post Control Unit I, Gannoruwa to solve problems arising with respect to the purification of seed paddy.
- Total numbers of 13 were approved as denominations of imported vegetable and OFCs.
- Opening of new buildings at Seed Testing Laboratory Paranthan, SCS Regional Offices at Murunkan and Rikillagaskada, and at Post Control Unit I, Gannoruwa.
- Developed a sprinkler irrigation system for the Post Control field IV at Maha Iluppallama.
- Essential repairs on vehicles and buildings of all units of SCS were completed.
- Seven radio programs and five TV programs were broadcasted during the year 2017.
- Contributed to distribute mother plants of departmental recommended varieties to the registered nurserymen under the DOA
- Started to develop mapping system for mother plants using GPS technology. In 2017, GPS readings were taken from 634 locations.

Seed Paddy Certification

During the year 2017, individual farmers as well as several government and private sector organizations such as DOA farms, Cooperative Societies, Provincial Councils, Govi Jana Kendra, Mahaweli Authority, Irrigation Department, Farmer Organizations, Private Companies, NGOs were registered for certified seed paddy production programs.

Total extent of registered seed paddy production was 4,676 ha, in which the share of private sector was 71%. The extent registered for certified seed paddy production by different sources and seed classes are given in Table 2.1.1.2. A 23% reduction of the extent of registered seed paddy production was observed in the year 2017 when compared to the year 2016, due to the severe drought conditions experienced during which farm lands were deeply affected by lack of water. In addition, severe flood conditions detrimentally affected on production targets, where many hectares of production fields were also affected in some part of the island.

Table 2.1.1.2: Extents under Seed Paddy production in 2016 and 2017

Source	Seed Class	2016		2017		Accepted %
		Extent registered	Extent accepted	Extent registered	Extent accepted	
		(ha)	(ha)	(ha)	(ha)	
Research stations	Breeder's	5.88	5.12	6.29	5.99	95
Govt. farms	Foundation I	50.80	38.86	75.96	74.34	98
	Foundation II			1.60	1.60	100
	Registered I	604.57	565.05	659.23	631.90	96
	Registered II	30.45	30.24	32.60	31.20	96
	Certified I	106.07	89.68	26.30	26.30	100
	Certified II	11.13	9.72	3.00	2.80	93
	Commercial II			1.20	1.20	100
Contract growers	Foundation I	1.42	0.61	0.40	0.40	100
	Registered I	154.45	74.39	49.79	43.24	87
	Certified I	363.56	302.02	418.65	284.96	68
	Certified II	40.08	30.97	0.40	0.40	100
	Commercial I			83.20	67.80	81
Private growers	Registered I	512.51	379.05	118.86	111.46	94
	Certified I	3885.33	2729.89	3067.48	2480.23	81
	Certified II	315.99	250.91	118.23	100.43	85
	Commercial I	7.49	1.62	10.83	10.03	93
	Commercial II			2.20	1.60	73
Total		6,089.3	4,508.3	4,676.22	3,875.88	83

During the year 2017, a total of 12,739 mt of seed paddy was sampled; of which the quality standards of 10,681 mt of seed paddy were qualified by laboratory tests (Table 2.1.1.3). The seed paddy production by contract growers of the DOA farms and the private

growers were 6,458 mt (51%) and 6,272 mt (49%), respectively. Despite having severe drought and uncertainty weather conditions during the year, the production of seed paddy by government and contract programs were increased by 18% compared to the year 2016.

Table 2.1.1.3: Quantities of seed paddy tested and % accepted in 2016 and 2017

Source	2016		2017	
	Quantity tested (mt)	Accepted %	Quantity tested (mt)	Accepted %
Research stations	8.48	92.5	8.7	94
Govt. farms	3453.7	89.8	4591.3	89
Contract growers	1328.4	83.4	1866.8	84
Private growers	9632.5	79.5	6272.2	80
Total	14,414.5		12,739.0	

Certification of Other Field Crops (OFC) seeds

The total registered extent under OFC seed production was 1,900 ha of which contract growers accounted for 85%. Maize, Green gram, Groundnut, Sesame, Cowpea, Finger millet, Horse gram, Mustard, Black gram and Soybean were included in the OFC seed production program. The extents of registered

seed production under different sources and classes are given in Table 2.1.1.4. There was a boost increment by 174% in registered extent on OFC seed production when compared to 2016 due to water scare areas tend to cultivate OFC's than paddy in 2017. The extent of hybrid seed production was increased to a satisfactory level in 2017 when compared to the last year.

Table 2.1.1.4: Extents under OFC seed production 2016 and 2017

Source	Seed class	2016		2017		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Research stations	Breeders	5.46	5.38	3.98	3.75	94
Govt. farms	Foundation	16.58	13.83	30.21	28.70	95
	Registered I	43.09	37.24	61.31	56.88	93
	Registered II			0.4	0.4	100
	Certified I	7.29	4.45	6.4	4.8	75
	Certified II	1.42	0.81			
	Hybrid	2.02	1.82	6.6	6.2	94
	Commercial I	2.83	2.63	1.01	1.01	100
Contract growers	Foundation			2.83	2.83	100
	Registered I	98.28	74.29	320.20	245.80	77
	Registered II	4.45	4.45	31.42	24.92	79
	Certified I	261.7	194.09	868.21	811.76	93
Contract growers	Certified II	164.57	76.11	211.70	150.00	71
	Hybrid			7.40	7.40	100
	Commercial I	27.63	12.04	160.08	121.22	76
	Commercial II	31.28	27.94	11.30	8.40	74
Private growers	Registered I	6.07	0.81	2.40	2.40	100
	Certified I	11.53	4.66	133.62	128.20	96
	Certified II	6.58	0.4			
	Commercial I	1.21	0.2	18.92	18.18	96
	Commercial II	0.81	0.81	16.30	15.20	93
	Hybrid			5.8	5.4	93
Total		692.8	457.3	1,900.09	1,643.45	86

In 2017, the total OFC seed production was 1,573 mt out of which 82.5% have been certified. It was a boost increment by 164% when compared to the 2016. The Quantities tested and percentages accepted from different sources are given in Table 2.1.1.5. Other than

in 2017, 332 mt of OFC were tested as C samples of which 77% were accepted. C samples means which are stored in cold storages for long durations and checked periodically for seed qualities.

Table 2.1.1.5: Quantities of OFC seed tested in 2016 and 2017

Source	2016		2017	
	Quantity tested (mt)	Accepted (%)	Quantity tested (mt)	Accepted (%)
Research stations	2.4	69.7	2.3	89
Govt. farms	82.7	91.7	315.0	81
Contract growers	502.7	91.4	1025.2	86
Private growers	6.7	83.9	230.8	71
Total	594.5		1,573.3	

Certification of vegetable seed production

The registered extent for vegetable seed production was 156 ha of which government and contract growers accounted for 66%. The total extent of vegetable seed production program increased by 77% from the year 1996. Registered land extents under different sources

and seed classes are given in Table 2.1.1.6. Tomato, Okra, Chilli, Red onion, Big onion, Snake gourd, Bean, Brinjal, Bitter gourd, Radish, Luffa, Capsicum, Yard long bean, Cucumber, Pumpkin, Amaranthus, Vegetable cowpea, Winged bean, Water melon and Papaya (fruit seeds) were also included in the seed production program.

Table 2.1.1.6: Summary of Vegetable seed production extents (ha) by class and source in 2016 and 2017

Source	Seed class	2016		2017		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Research stations	Breeders	1.71	1.21	1.34	1.16	87
Govt. farms	Basic	1.42	1.21	12.63	11.50	91
	Standard I	19.5	14.4	30.40	25.59	84
	Standard II			1.00	1.00	100
	Hybrid	0.2	0.2	1.02	0.87	85
Contract growers	Standard I	30.79	20.63	36.01	28.71	80
	Standard II			20.71	20.41	99
	Commercial I			1.10	1.10	100
Private growers	Standard I	34.81	26.01	47.40	39.70	84
	Commercial I			4.60	4.20	91
Total		88.43	63.66	156.21	134.24	86

Table 2.1.1.7: Quantities of Vegetable seed production in 2016 and 2017

Source	2016		2017	
	Quantity tested (mt)	Accepted (%)	Quantity tested (mt)	Accepted (%)
Research stations	0.30	91.25	0.11	98
Govt. farms	7.55	86.17	27.1	82
Contract growers	11.56	95.93	14.9	67
Private growers	9.27	94.33	5.9	72
Total	28.68		48.0	

During the year 2017, total vegetable seed production was 48 mt of which 37 mt were certified. It was a 67% increment when compared to the year 2016. Quantities tested and percent accepted from different sources are given in Table 2.1.1.7. As well as 69 mt were tested as C samples of which 95% were accepted.

Seed Potato Certification

The extent of cultivation of seed potatoes belong to different seed classes are given in the

Table 2.1.1.8. The total extent of land cultivated with seed potato was 77 ha and the total quantity of 701 mt of popular seed potato variety, Granola was certified. There was a 14% increment of extent registered while certified production was decreased very slightly by 1.96% in the year 2017 when compared to the year 2016. Under the poly tunnels 1,087,416 mini tubers were produced; a figure of 20% reduction compared to the year 2016. Quantities of mini tubers tested from different sources are given in Table 2.1.1.9.

Table 2.1.1.8: Extents under seed potato production in 2016 and 2017

Source	Class	2016		2017		Quantity accepted (mt)
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Govt. farms	Pre-basic	0.19	0.19			
	Basic	5.82	5.41	16.72	16.3	247.19
	Certified I	50.51	49.20	0.13	0.13	1.73
	Certified II			39.11	38.51	372.74
Private growers	Certified I	10.93	10.93	20.24	20.24	69.35
	Certified II			0.81	0.81	10.00
Total		67.45	65.73	77.01	75.99	701.01

Table 2.1.1.9: Production of mini tubers of Potato

Source		2016		2017	
		Amount	No. of mini tubers	Amount	No. of mini tubers
Govt. farms	No. of Plants	50,067	877,980	86,404	769,735
	Extent (m ²)	1,961	333,959	1,543	224,109
Private growers	No. of Plants	4,710	73,102	18,401	93,572
	No. of pots	1,970	18,925		
	Extent (m ²)	400	60,000		
Total			1,363,966		1,087,416

Lot Breaking

Before issuing the seeds to the seed production programs, the certified seed lots in the storages are divided into small quantities. The SCS is offering services for owners possessing certified seed lots from departmental and private seed storages. During the year 2017, lot breaking quantities of OFC and vegetables are given in Table 2.1.1.10.

Table 2.1.1.10: Lot breaking lots, quantities in 2017

Crop	No. of lots	Quantity of lots (kg)	Number of breaks
OFC	258	26,364.5	3,653
Vegetables	583	3,806.8	2,518
Total	841	30,171.3	6,171

Seed Testing

15,428 seed samples were tested for quality assurance at the DOA seed testing laboratories in Peradeniya, Mahailuppallama, Aluttarama and Bata-atha.

Registration of nurseries

Total number of nurseries registered in 2017 was 324.

Seed Health Testing Unit

152 seed samples were tested for seed borne pathogens at the Seed Health Testing Laboratory in Peradeniya.

Certification of Planting Material

A total of 577,777 fruit plants produced in government nurseries and private nurseries were certified and labeled (Table 2.1.1.11).

Table 2.1.1.11: Number of grafted fruit plants certified in 2016 and 2017

Species	No. of plants certified	
	2016	2017
Mango	328,707	323,160
Rambutan	109,099	51,334
Citrus	251,477	184,388
Avocado	5,081	2,395
Durian	2,818	4,813
Jak	4,257	7,831
Pears	1,653	1,764
Goraka		1,482
Others	1,009	610
Total	704,101	577,777

Mother plant certification

During the year 2017, a total number of 586 Mango, Rambutan, Citrus, Durian, Carambola

and Uguessa mother plants were selected and registered. (Table 2.1.1.12).

Table 2.1.1.12: Number of mother plants registered in 2016 and 2017

Species	No. of plants registered	
	2016	2017
Mango	99	518
Rambutan	42	41
Citrus	50	20
Avocado	01	
Durian	32	02
Jack	04	
Other	07	05
Total	235	586

Post-Control Testing

Post-control tests were conducted to evaluate 830 seed samples. These included DOA-certified seed samples and imported seeds of different crop varieties, Seed Potatoes and samples collected from market and problem samples. Number of post control tests conducted, under different crop categories are given in Table 2.1.1.13.

Table 2.1.1.13: Number of post control samples tested

Crop group	No. of lots tested
Paddy	120
OFC	146
Vegetables	239
Fruits	03
Potato	108
Problem samples	18
Hybridity testing	14
Research samples	110
Other	39
Total	830

Distinctness, Uniformity, and Stability (DUS) Testing

Eleven paddy varieties, (At 08-617, At-1078, Bg 08-1909, Bg 1258, Bw 11-3403, Bw 3-1198, CIC 2.5-2, IRDTN 7-11, MA-2, Zhonghua-1) were tested for DUS at post-control fields in Gannoruwa and 6 vegetable varieties, 15 OFC varieties and 1 fruit variety and 2 parental lines were also tested in post-control fields at Gannoruwa, Mahailuppallama and Bata-atha. The DUS testing of 6 paddy samples, 1 vegetable, 13 OFC, 1 fruit variety and 2 parental lines were completed during the year. (Table 2.1.1.14).

Table 2.1.1.14: Number of DUS Tests Conducted

Crop group	No. of tests conducted	No. of tests completed
Rice	11	06
OFC	15	13
Vegetables	06	01
Fruits	03	03
Total	35	23

Implementation of the Seed Act

The Seed Act No. 22 of 2003 has been implemented from 2008 with the objective of safeguarding the farmers and the seed handlers from malpractices that would harm the seed industry of this country, which is a vital sector of the country's agriculture. In 2017, 917 seed handlers were registered and 890 registration renewals were carried out under the Seed Act. Twenty one field complaints were received; they were inquired and remedial actions were taken to safeguard the farmers.

262 random inspections of seed handler premises were carried out in order to assess the

present situation and to advise them on proper handling of seed and planting material prior to marketing. The National Seed Council was established and its first Committee meeting was held on 29th November 2017 to discuss matters to ensure production and distribution of seed and planting materials to the highest quality. 160 labels were approved and 35 training programs were held to create awareness among 3,365 government and private sector Officers, and seed handlers.

Research and Development

Research Projects

- AFACI (Collaboration in the construction of Epidemiology Information Interchange System for Migratory Diseases and Insect Pest in Asia Region(IPM))
- Development of the seed film coating techniques for vegetable seeds.

Radio Programs

In 2017, SCS participated at 7 radio programs, namely “Aswenna” on Kandurata Sewaya, "Govijana Mandala” on ITN channel, 2 programs of “Govi Gedara” on Swadesheeya Sewaya, “Ransawiya” on Rangiri Radio channel, and 2 programs on Wayamba Radio.

TV Programs

The SCS also participated in 5 TV programs telecasted on “Govibimata Arunalu” and “Nugasewana” on Jathika Rupavahini channel regarding the Seed Act, activities of the Field Inspectorate Division, Perennial crop section and Variety section of Seed Certification Service.

Training Programs

The SCS continued to conduct training programs to enhance the knowledge of officers and seed handlers on production of quality seeds and planting materials. (Table 2.1.1.15)

Table 2.1.1.15: Number of trainees trained

Training Programs	No. of trainees
Seed farmers	193
Nursery men	176
Govt. Sector Officers	1,095
Private Sector Officers	224
Others	553
Total	2,241

Denominations of imported seeds

After importation of vegetables and OFC crop varieties, they are commercialized in different trade names which are familiar to Sri Lankan farmers. The Denomination Committee is chaired by the Additional Director of Seed Certification Service and the rest of the members are from SCPPC, SPMDC, HORDI and the NPQS. This Committee was started since 2013 and 70 number of denominations were approved up to now for 16 seed companies.

Foreign Training

Twelve officers were trained in China, Japan, Indonesia and Egypt as follows.

Table 2.1.1.16: Foreign trainings during 2017

Country	No. of trainees	Training Title
Japan	01	Plant variety protection and quality control system of seed to facilitate distribution of high quality seeds.
China	09	Green economy and Environmental protection, Organic crop cultivation, quality and safety of Agricultural products for developing countries, Hybrid Maize developing technology, bee keeping management, Hybrid rice high yield cultivation techniques
Egypt	01	Vegetable production
Indonesia	01	IPM workshop

PLAN FOR 2018

- Empowering seed certification service to achieve the 30% of the national seed paddy requirement by certified seeds.
- Implementation of seed quality testing for Northern region while activating Paranthan seed testing laboratory.
- Establishment of seed research unit to conduct seed technology research

pertaining to the seed quality encountered by seed handlers especially on seed packaging, storing and expiring dates.

- Conducting survey for identification of major seed borne pathogens.
- Development of detection techniques for seed borne pathogens of major crops.
- Studies on effect of seed borne pathogens on seed health and storability of stored seeds of vegetable crops.
- Development of seed drying technology using Zeolite beads for proper storage.
- Seed Act implementation to regulate the seed production process among state and private sector seed handlers to make available high quality seeds and planting materials in the country while avoiding malpractices in the seed industry.
- Establishment of mobile registration system for seed handlers.
- Preparing guidelines on quality seed and planting material production to distribute among the all seed handlers.
- Preparation of national test guideline of DUS for selected crops.
- Develop mobile application of other field crops for variety identification.
- Preparation and distribution of seed producer's directory and planting material producer's directory in each growing season.
- Publishing crop guide lines for seed handlers.
- Publish a Mother plant directory for public awareness
- Characterization of fruit plant varieties.
- Preparation of training modules for production of quality seeds and planting materials for seed farmers and nurserymen.

- Construction of new SCS regional sub offices in Moneragala.
- Strengthening all SCS units with staff and infrastructure facilities.

STAFF LIST

Designation	No. Existing
Additional Director	01
Assistant Director of Agriculture (Research)	02
Assistant Director of Agriculture (Development)	12
Agriculture Instructor (Special)	01
Agriculture Monitoring Officer	03
Program Assistant (Agriculture)	02
Development Officer	16
Agriculture Instructor	110
Research Assistant	02
Public Management Assistant	09
Technological Assistant	43
Seed Technician	18
Driver	15
Tractor Operator	03
Store Keeper	01
Storeman	01
Electrician	01
Research Sub Assistant	03
Seedman	31
Circuit Bungalow Keeper	01
Watcher	36
Laborer (Permanent)	104
Sanitary Laborer	01
Laborer (Contract)	32
Total	448

2.1.2. PLANT PROTECTION SERVICE (PPS) - GANNORUWA

The mandate of the Plant Protection Service revolves around regulatory activities within the country as stated in the Plant Protection Act No. 35 of 1999. For example, when an alien pest enters the country and begins to affect the crops in a detrimental manner the responsibility lies with the Plant Protection Service to deal with it by employing appropriate control and risk mitigatory measures.

The core activities of the Plant Protection Service can be stated as control of pest/disease outbreaks, implementation, monitoring and evaluation of field level IPM programs in rice, vegetables, fruits and other field crops, managing pests in bulk seed storage in the Department of Agriculture farms through fumigation and conducting research & experiments on pest management and pesticides.

In addition, mitigating the impact of aquatic weeds and other invasive flora in agricultural

habitats, training of officers and farmers, evaluation of new pesticides at pilot-scale, re-validating efficacy of recommended pesticides to ensure the plant health of agricultural crops are also mandatory functions assigned to the Plant Protection Service.

Furthermore, the Plant Protection Service has been given the task of co-coordinating the activities of Permanent Crop Clinic Program (PCCP), which is being currently implemented in 24 districts in the country.

Vision

Achieve the excellence in agriculture for national prosperity by plant protection.

Mission

Development and promotion of healthy, low cost, environmental friendly and efficient management of pests and invasive alien species by the implementation of the Plant Protection Act No. 35 of 1999.

BUDGET

Table 2.1.2: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	2,112,947	1,814,598	86
Capital	2,094,000	1,648,915	79
Projects			
• National Food Production Program	1,800,000	1,580,000	88
Total	6,006,947	5,043,513	84

PROGRESS

Implementation of the Plant Protection Act No. 35 of 1999

During the year, 119 new Authorized Officers (24 officers from the Department of Irrigation and 95 officers from the National Plant Quarantine Service, Katunayake) were directly appointed as Authorized Officers to implement the Plant Protection Act. They were also trained on:

- Legislative background of the Plant Protection Act No. 35 of 1999.
- Implementation of the Plant Protection Act at field level.
- New pests of quarantine significance in Sri Lanka.
- Integrated Pest Management.
- Identification and Management of Invasive Alien Species (IAS).

Forty five Authorized Officers were trained on the Plant Protection Act No. 35 of 1999 at the In-service Training Institute, Gannoruwa.

Promotion of Integrated Pest Management (IPM) and Good Agricultural Practices (GAP)

Integrated Pest Management (IPM) and Good Agricultural Practices (GAP) are integral processes/ activities for the sustenance of plant protection with minimal impact on human health and the environment. Programs were conducted to improve the knowledge of extension officers and farming communities on IPM and GAP concepts, giving special to minimize the use of pesticides by promoting the application of non-chemical pest management strategies for efficient pest management at farmer field level. The program

was focused on four crop categories namely paddy, vegetables, fruits and other field crops.

• Rice IPM / GAP Program

White revolution is the new concept of the Department of Agriculture which aims to promote judicious use of pesticides. The main objective of this program is to reduce pesticide usage to combat pesticide-induced health problems and environmental pollution. During the year, 210 extension officers and 295 farmers were trained on IPM concepts. Special attentions were given on identifying pests and natural enemies at each growth stage and managing pest populations below the economic injury level, by applying different strategies, applicable under farmer field conditions. These concepts are in harmony with conservation of natural enemies in the agro-ecosystem while managing the pest populations at non-destructive levels.

• Vegetables, fruits, other field crops and home garden IPM Program

This was implemented to develop safer low cost, environmental friendly and efficient IPM packages for vegetables and to promote them among extension officers and farmers. Also there were training for officers and farmers to promote herbal pesticides as an alternative for synthetic pesticides (Promotion of natural/ herbal pesticides to reduce synthetic pesticides).

Number of training programs for extension officers was conducted at different locations where total of 656 officers and 857 farmers were trained. Two television program and seven radio programs were telecasted and broadcasted to promote this technology.

Pilot scale testing of herbicides

Eight new herbicides were evaluated under farmer field conditions for their bio-efficacy, which were better than the already recommended herbicides in their target specificity and lower application rates.

Biological control program on

Aquatic weeds

Cultures of bio-control agents such as *Cyrtobagous salviniae* for Salvinia (*Salvinia molesta*) and *Neochetina bruichi* as well as *Neochetina eichhorniae* for water hyacinth (*Eichhornia crassipes*) are maintained by the PPS. Introduction of these bio-control agents was conducted as per requests made by government, private or non-government organizations. For example, a two-day training program coupled with field release of bio-control agents was conducted at the Irrigation Department at Kotmale and trained 25 officers. In each of these occasions awareness programs were conducted at the site for stakeholders about the life cycle of released bio-control agents and their interaction with the targeted weed. Under this program, bio-control agents were introduced to 23 infested reservoirs in many districts and 244 stakeholders were trained.

Permanent Crop Clinic Program

Permanent Crop Clinic Program (PCCP) was assigned to the PPS since March 2013 by the Department of Agriculture (DOA). It is a collaborative program between the Center for Agricultural Bio Science International (CABI) in the United Kingdom and the DOA.

The program aims to strengthen national plant health system through developing local capacity to establish and manage the PCCP.

The partnership with CABI aims to promote sustainable agricultural practices that enhance productivity, improve the livelihood of small-holder farmers and protect biodiversity.

The PPS has been given the responsibility as the National Responsible Organization (NRO) to coordinate with national partners in managing crop clinics. Some of the highlights of the PCCP are mentioned below:

- Senior level officers selected from Research and Extension divisions were trained as “master trainers” through modules 1, 2, 3 and 4 on the following aspects.
 - How to become a “Plant Doctor”
 - Managing plant health problems
 - How to become a technical writer and green and yellow lists
 - Monitoring and evaluation of crop clinics
- During the year, 382 agriculture extension officers were trained as Plant Doctors in 08 districts and 5 inter-province districts.
- The PPS organized many training workshops for national trainers within the country. Also a progress review and way forward meeting on the PCCP was held in the Hotel Topaz, Kandy on 18th & 19th December 2017 with the participation of Director General and Additional Director General (Development), Directorate of the DOA, Provincial Directors and all other Deputy Directors in the agriculture extension system.

Technical Assistance in Fumigation

of Seed Storages of DOA Farms

4,683.73 mt of seed materials (rice 3,682.79 mt, other field crops 785.14 mt and vegetable

seeds 216.3 mt) were fumigated to control storage pest attack in Ambalantota, Pelwehera, Kantale, Polonnaruwa, Murunkan, Kilinochchi, Mahailuppallama, Nikaweratiya and Aluttarama DOA seed storages.

Technical Assistance in Field Rat Management

Forty six DOA officers and 107 farmers were trained to manage rice field rats in several districts.

Technical Assistance to Control Invasive Weeds

Invasive weed control programs on Parthenium (*Parthenium hysterophorus*), Alligator (*Alternanthera philoxeroides*) and Giant mimosa (*Mimosa pigra*) were conducted by technically assisting in many areas. Under this program, 333 officers and 46 farmers were trained on the management of alien invasive species.

One television program was telecasted to promote this technology.

Pest surveillance programs

Paddy pest infestation data were collected from extension areas of nineteen districts and a database was developed. These data were utilized to prepare a summary with graphical presentation, which was distributed back to them. In addition, short messages on current incidences of pest situation were frequently broadcasted through the radio to alert farmers on present pest problems.

Control of pest / diseases in sacred “Bo” trees

Three “Bo” trees belonging to several historic temples were treated to protect them from

some pest/ disease infections such as termites, fungal diseases etc.

Exhibitions

Eco-friendly pest management technologies and other activities of the PPS were demonstrated for public in ‘Thirasa ratak-Suwadai hetak’ exhibition in the Regional Agriculture and Research Centre, Makandura.

PLAN FOR 2018

- Implementation of the Plant Protection Act No. 35 of 1999
- Promotion of Permanent Crop Clinic Program
- Promotion of Integrated Pest Management (IPM) and Good Agricultural Practices (GAP) for rice, vegetables, fruits and home gardens
- Pilot-scale testing of weedicides
- Biological control program for aquatic weeds
- Technical assistance in fumigation of seed storages of the DOA farms
- Technical guidance to manage termites in the DOA premises
- Technical guidance to manage rice field rats
- Technical assistance to control invasive weeds
- Technical guidance to manage dangerous agricultural pest problems
- Promotion of pest surveillance programs
- Promotion of the use of herbal pesticides
- Control of pest / diseases in sacred “Bo” trees
- Active participation in agricultural exhibitions

STAFF LIST

Plant Protection Service, Gannoruwa

Designation	No. Approved	No. Existing
Additional Director	01	-
Deputy Director	09	01
Assistant Director of Agriculture (Research)	02	-
Assistant Director of Agriculture (Development)	11	01
Development Officer Agriculture	01	02
Instructor	05	04
Research Assistant Technological	-	01
Assistant Public	-	01
Management Assistant	03	03
Driver	05	05
Lorry Cleaner	01	01
Office Employee	01	01
Watcher	02	02
Laborer	07	05
Laborer (Contract)	02	01
Total	48	28

Plant Protection Unit, Mahailuppallama

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Development)	01	01
Agriculture Instructor	03	01
Driver	01	-
Laborer	01	-
Total	06	02

Plant Protection Unit, Bombuwa la

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Development)	01	-
Assistant Director of Agriculture (Research)	01	01
Agriculture Instructor	02	02
Laborer	01	-
Total	05	03

2.1.3 OFFICE OF THE REGISTRAR OF PESTICIDES (ROP)- PERADENIYA

The Office of the Registrar of Pesticides was established in 1984 for the implementation of the Control of Pesticides Act No. 33 of 1980 for ensuring high quality pesticides for pest control and assuring safe & efficient use of pesticides for human health & environmental protection. Accordingly, Registrar of Pesticides (ROP) is empowered and entrusted to regulate pesticides imported to and produced in Sri Lanka, to assure their quality and safe use and to assess and to declare Maximum Residue Limits (MRLs) in agricultural produce. As such main activities include

- a) registration of pesticides imported to Sri Lanka
- b) giving import permits

- c) regulation of labels and advertisements
- d) registration of pesticide importers, pest control services and pesticide traders,
- e) random quality checking of imported pesticides and
- f) testing of pesticides residues in agricultural produce.

As a novel initiative, a memorandum was presented to the Director General of Agriculture in December 2017 to establish a sub-committee to monitor field implementation progress & other related functions under the Act, in order to address key performance gaps in the field implementation program.

BUDGET

Table 2.1.3.1: Annual budget- 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)	Income (Rs.)
Recurrent	4,722,439	4,507,023	95	
Capital	3,200,000	2,913,104	91	
Projects				
• Minimizing potential adverse effects of pesticides in Sri Lanka (Special grant)	5,000,000	4,997,024	100	
Earnings				
1. Registration fee				7,285,000
2. Re-registration fee				788,000
3. Pesticide dealer license fee				558,850
4. Pest control service registration fee				160,000
5. Pest control license renewal fee				265,000
6. Import license fee				720,000
7. Company registration fee				1,550,000
8. Agrochemical sales and Technical Assistant application fee				20,100
9. Miscellaneous				27,120
Total	12,922,439	12,417,211	96	11,374,070

PROGRESS

PESTICIDE REGISTRATION

All pesticides are required to be registered under the Act before importation, manufacturing & use in the country. Companies intending for marketing of pesticides in Sri Lanka is required to submit applications for registration of pesticides according to compulsory registration requirements as set out under the Section 6 of the Act.

Generally, registration applications are intended for registration of new pesticide active ingredients, or new products for existing pesticides, or adding a new use to an existing product.

Timelines for review of pesticide registration applications

In order to be efficient & time-bound delivery of services for the assessment of pesticide registration applications, a time-bound evaluation schedule was presented for all pesticide applications pending registration as of July 2017. Seventeen such applications, hitherto accumulated from previous years were assigned for appropriate product evaluators for the initial assessment.

Status of new registration of pesticides

During the year 2017, the Office of the ROP received 14 registration dossiers; of these, 6 were evaluated, with an average review time of 9–12 months, while altogether 14 dossiers were evaluated from the backlog. The following listing indicates the types of new

pesticides or new formulations or new sources of already registered pesticides.

- New molecules – Bentazone 48% SL, Hymexazol 26% SL, Pymetrozine 5% WG, Halosulfuron–methyl 75% WG
- New formulations – Cyhalofop–butyl 6% + Pyribenzoxim 2.5% EC, MCPA 7.5% + Propanil 60% DF, Propanil 23% + Oxadiazon 8% EC
- New sources – Pendimethalin 30% EC, Buprofezin 40% SC, Emamectin Benzoate 5% SG, Acetamiprid 20% SP, Pretilachlor 30% EC, Pymetrozine 5% WG, Azoxystrobin 12% + Tebuconazole 20% SC

During the year 2017, three (3) novel active ingredients were registered increasing the total pesticide active ingredients registered in agriculture up to 110. Since, all newly added active ingredients are classified as ALS inhibitor/sulfonyl urea herbicides, strict guidelines were presented for marketing & use with farmer advisories.

Altogether, six pesticide formulations were registered during the year, adding three new active ingredients viz. Nicosulfuron (4% OD), Halosulfuron-methyl (75% WG) & Triafamone (20% SC) and another three supplementary formulations, viz., Acetamiprid 20% SP, Azoxystrobin 25% SC & Buprofezin 25% SC to the existing registered product list.

Re-registration of pesticides

The registration of a product is valid only for 3 years after which the product status is reassessed for new scientific and regulatory standards. Under this scheme, product safety, quality and the performance are assessed from freshly generated toxicity and product quality tests from most authoritative sources (e.g.

Good Laboratory Practices, GLP complied & accredited laboratories). Currently, there are over 600 commercial pesticide products are handled in general (mostly agricultural pesticides), domestic and restricted categories. Following progress was achieved during the year is given below.

- Acceptance of applications for new registrations–55
- Acceptance of applications for re-registration–197
- Preparation of new registration certificates–49
- Preparation of re-registration certificates–180

During the year, 229 products were eligible for registration & re-registration and licences were issued for a period of 3 years as per the Section 7 of the Act.

New guidelines for supplemental pesticides and “me-too” pesticide registrants

The provisions incorporated under the Act to register commodity pesticides are defined in two categories: viz. (1) Registration of the original products for indenting purposes, while leaving the entire importation & marketing operations for the intended registrant, and (2) Registration of the original products for own importation & marketing, while offering an extended consent for supplemental registration for importation & marketing by the supplementary registrant.

In contrast, recently, it has been observed that there is an increasing trend in the pesticide industry to request for supplementary registrations with the consent that extended market distributions are entertained while

allowing supplementary party/parties to share pesticides from out of the stocks imported by the original registrant. In such situations, the guidelines were proposed for immediate compliance by all original registrants and supplemental registrants. In a Circular issued in December 2017, all registrants were asked to comply with information sharing with the product manufacturer, extended liability on supplementary registrations & to prevent data duplications on annual data submission of imports & sales, etc.

Harmonization of pesticide recommendations across crop sectors

In consequent to the report of European Commission Audit (Ref. DG (SANTE)/2016–8787–MR Audit in Sri Lanka from 14–22 September 2016) & Ref. Section 17 therein, which stated “*In the case of tea, the Sri Lanka Tea Board also issues circulars with statements on the list of pesticides that can be used. However, neither circular from TRI nor from the SLTB are updated in line with the authorization of pesticides by the ROP, and, in some cases contain active substances that have been banned or plant protection products for which authorizations have been revoked*”. The Auditors have also noted that the growers/consumers are compromised by the lack of complete and updated register of authorized products, and by contradictory information on recommended uses issued by different authorities.

Based on the above revelation, under the leadership of the Office of the ROP, a sub-committee was appointed to re-visit the entire recommendation manuals/ circulars/ advisories

issued so far under different institutional perspectives. The final outcome in this entire endeavour would be to compile a most up-to-date pesticide recommendation for national interests, thereby alleviating deficiencies in the availability of updated and consistent information on plant protection products to the grower/ consumer. The necessary data were compiled as of 10th April 2017 in a common layout on all officially recommended plant protection products pertaining to different commodity research institutes.

Pesticide Technical & Advisory Committee and its conductance

Pesticide Technical & Advisory Committee (PeTAC) was established in 1995 under the Control of Pesticides Act No. 33 of 1980 and its first meeting was held in 27.01.1995. This Committee was created as a forum to advice the Registrar of Pesticide on policy matters on regulation of pesticides in Sri Lanka. The year 2017 marked a year of significant accomplishment holding its all six business meetings in a more orderly & regular intervals (two months intervals in every last Fridays).

In February 2017 at its 84th meeting, the Committee adopted its rules of the meetings as pursuant to the provisions available by the Minister of Agriculture under Section 5 (2) of the Control of Pesticides Act No. 33 of 1980 & submitted to the legal draftsman for legal scrutiny. Seventeen itemized rules were formally approved.

The new membership was appointed from June 2017 in replacement of outgoing members, who had served for 3 years. The newly appointed members will have their powers to represent at the PeTAC for a period of three

years with effect from July 6, 2017. The first meeting with the newly appointed members was held on 31st August 2017.

Coordination with other institutions on registration matters

Pre-evaluation of pesticides is a critical step towards sustenance of safe & efficient pesticide management in Sri Lanka. The technical sub-committees on different product categories viz. agricultural, public health and industrial pesticides serve as the preliminary screening and approval mechanism for candidate pesticides. The sub-committees (subject-discipline) have been established under the authority provided by section 5(1) b of the Control of Pesticides Act.

During the year 2017, three Agro pesticide sub-committee meetings (24th through 27th) were held & 131 applications were screened including a range of fungicides (20), herbicides (45), insecticides (18), nematicides (03), miticides (01), molluscicides (01) & pesticides of synthetics origin which include organic fungicides (plant extracts), organic insecticides (Plant extracts), organic nematicides (plant extracts), organic weedicides (plant extracts), bio control agents (as fungicide and nematicide), microbial insecticide, microbial nematicides and mineral fungicides.

Four meetings (13th–16th) of the Public health pesticides sub-committee and one meeting (9th) of the Industrial pesticides sub-committee were held during the year.

Following decisions were taken during sub-committee evaluations.

1. A range of household pesticides requested by M/s Fumikila for donation through the Ministry of Health for the control of

mosquitoes were turned down by the public health pesticides sub-committee due to non-conformity with the WHO recommended concentrations and/or not in conformity with the locally recommended products & their concentrations of the active ingredient/s.

2. The public health pesticides sub-committee recommended a range of insecticide-impregnated paints (Inesfly® 5A IGR NG Paint, Transfluthrin IGR Paint, & Inesfly® Carbapaint 10) to be used as a novel concept of “Insecticide Residual Spraying” IRS against mosquitoes. The bio-efficacy assessments are being continued for deciding the residual efficacy under local climatic conditions.

3. The agro pesticides sub-committee recommended Deltamethrin incorporated Zerofly® storage bag for use by the Paddy Marketing Board. The sub-committee impressed with the hermetic inner polythene bag as it resists absorbing moisture to the inner grain & it has also minimal risk of contamination of stored products.

4. The agro pesticides sub-committee turned down the concept of recommending two systemic fungicide active ingredients, e.g. Azoxystrobin 120 g/l + Tebuconazole 200 g/l SC in a single pesticide product on efficacy & residue concerns.

5. DOA had cautioned about whitefly epidemics in agricultural crops such as Chilli and devastating crop damage by Chilli leaf curl complex. Therefore, two novel insecticide classes were chosen for priority evaluation, i.e. Sulfoxaflor 50% WG (4C IRAC mode-of-action, Nicotinic Acetylcholine Receptor) and Pymetrozine 50% WG (9B IRAC mode-of-action, Modulators of chordotonal organs).

6. Priority considerations were given on short-residual insecticides on leafy-vegetables. Pymetrozine 50% WG (9B IRAC mode-of-action, Modulators of chordotonal organs) was given approval for control of leaf feeding homopterans on leafy-vegetables.

Development of guidelines & registration status of bio-pesticides, including botanical pesticides

In response to facilitate effective bio-pesticide manufacture and use in Sri Lanka, with the agreement of the PeTAC, a provisional registration mechanism was proposed “*upon bio-efficacy evaluations are conducted at a government research institution satisfactorily and in parallel, the chemical composition is analysed, known & justifiable, a provisional registration can be granted pending submission specifically mentioned other data requirements for registration under the Act*”.

The proposed mechanism would offer relaxation for local bio-pesticide manufacturers to get their products registered and to promote their products in the local market.

Meanwhile, the regional consultation workshop on facilitating the use of microbial pesticides in South Asia was held on 21–23 August, 2017, NBAIR, Bangaluru, India, which was opened new understanding on bio-pesticides & future prospects. An officer from the Office of the ROP participated at the above workshop.

As part of the overall commitment to support local manufacturing of bio-pesticides, and as reference to the follow up actions proposed at the consultative workshop held on 28.10.2016 at the Ministry of Agriculture on registration of bio-pesticides in Sri Lanka, and on review of

relevant technical guidelines on the same, the bio-pesticides evaluation committee was strengthened by appointing new membership; the new membership represented by eminent scientists from commodity research institutes & academia. This was due to retirement of the earlier membership & owing to conflicts of interest of few members engaged in bio-pesticides manufacturing in the country. The above nominations were formally approved by the Director General of Agriculture on 26.12.2017.

There are entrepreneurial motives to introduce biological pesticides in the country. In this effect, several proposals were discussed and evaluated by a team of experts on the requirement for registration of biological pesticides on different origins. They consented on the following products for bio-efficacy assessments: Termaron® Entomopathogenic Fungi *Metarhizium anisopliae*- M/s Sri Bio-Tech Lanka (Pvt.) Ltd., Shot borer-Entomopathogenic Fungi *Beauveria bassiana*, Blister blast Antagonistic Fungi *Tricoderma viride* + *Tricoderma harzianum*- M/s Sri Bio-Tech Lanka (Pvt.) Ltd., Natural Insecticide Botanical- S. Michal, Sri Lanka, D-Com Liquid (Insect Repellant) Botanical-Dougless Peiris, Sri Lanka, Locally Produced Insect Repellant- Hemamala Fernando, Sri Lanka, Saraboomi Agro- Insect Repellant -Udara Rajarathne, Sri Lanka, Liquid fertilizer with bio-pesticidal action- M/s Bio Crop Eco Lanka, Natural Insecticide - H.E.M.C. Bandara, Sri Lanka).

Registration of pesticide establishments

All pesticide companies are required to be registered with the ROP with the intention that

all functions associated with pesticide business are critically evaluated as competent in a manner to safeguard human health, environment and wildlife resources as pursuant to the Sections 5 (a) and 5 (b) of the Government Gazette Extraordinary No.1870/63 dated 10.07.2014.

As of December 2017, 91 company profiles have been evaluated; 40 companies were certified & issued certificates as suitable to carry out pesticide business as per the above regulation.

The regulatory & management model places responsibility on companies to demonstrate compliance with applicable standards. In this effect, persistent guidance has been given for the companies in the form of Circulars dated 17.07.2014, 23.02.2016 & 25.10.2016 on general compliance aspects and by the Circular No. RP/2017-02 dated 30.01.2017 on company authorization on quality, health and environmental safety aspects. Further, all licensees under the above program are periodically (often annually) verified for active compliance on the certification requirements under the paragraph above.

Status of pest control services & actions against illegal conductance

The existing scheme for licensing of pest control service institutions are based on the technical capacity and infrastructure in terms of prior experience, training qualifications, availability of equipment etc. in order to conduct specialized pest control services viz., general pest control, pre-/post-construction and structural termite control and pre- and post-quarantine fumigation using restricted and other pesticides.

During the year 2017, two institutions were registered after fulfilling necessary pre-requisites for the required operations. As per the regulations made by the Minister of Agriculture under the Section 26 of the Act, published in the Extraordinary Gazette No. 1655/7 dated 25.05.2010 all institutions registered so far have been approved by PeTAC before issuing licenses for qualified pest control service institutions.

As pursuant to the provisions stated under the Control of Pesticides (Pest Control Service) Regulations No. 01 of 2010, all pest control service providers must register with the ROP and obtain a license for that purpose.

A Public Notice-PCS/02/2017 was issued on February 2017 in response to the understanding that some institutions/consultancies have been engaged in pest control activities as a service to public and private institutions without obtaining proper authority for that purpose.

The public notice served commitment to educate every responsible citizen in the country to follow the laws and regulations. It was urged from the general public to refrain from employing or servicing such unlicensed institutions for pest control operations within their establishments. A list of approved pest control providers has been published in the www.doa.gov.lk or any public can simply ask for the valid license issued by the ROP. A Public Notice was published on 23.02.2017 in “Dinamina” newspaper, detailing the full list of approved institutions with necessary guidance on “*How to select pest control institutions by the public for reliable & effective pest control service*”.

Screening of labels and advertising materials

Label approval procedure enabling dissemination of proper information to the end user has been a recurrent activity. The Section 18 of the Act declares that any written, printed or graphic material relating to and accompanying a pesticide when stored, transported, distributed, sold, offered for sale or delivered within the country shall include the substance of the particulars referred in the approved label. The number of labels and advertisements screened during the year were 1047 and 152, respectively.

Proposed coding system on pesticides labels according to the mode-of-action

The rotation of active ingredients (of insecticides, herbicides, fungicides etc.) for the purposes of resistance management should be based entirely on differences in Mode-of-Action. Therefore, the following contemporary initiatives were adopted to indicate the Code of Mode-of-Action on pesticide labels with immediate effect. The relevant coding nomenclature was selected as per the Insecticides Resistance Action Committee (IRAC) <http://www.irc-online.org/modes-of-action>, Fungicides Resistance Action Committee (FRAC) <http://www.frac.info/docs/default-source/publications/frac-code-list/frac-code-list-2016.pdf> and Herbicides Resistance Action Committee (HRAC) <http://wssa.net/wp-content/uploads/herbicideMOAClassification.pdf>. Accordingly, all existing pesticide labels were updated in line with the above guidelines

at the point of re-registration. It was believed that by taking proactive actions to popularize and adopt selection of pesticides will enhance managing pesticide resistance through informed decisions on correct selection of pesticides and giving necessary awareness through regular field programs. The following activity-specific targets were achieved.

1. Screening of Agriculture, Domestic & Public Health Pesticides labels for approval- 1047.
2. Screening of Agriculture, Domestic & Public Health Pesticides promotional materials for approval- 152.

Status of marketing of sulfonyl urea/ALS inhibitor herbicides

The intensive use of Sulfonyl urea herbicides including ALS inhibitors has shown some indication on possible resistance emergence/selection among some of the weed spectra in rice fields. Accordingly, Office of the ROP request of the research & extension divisions of the DOA and the pesticide industry to look for reforms for resistant management, including actions such as use restrictions and regional recommendations.

The collaborative assessment results were presented at the 25th Agro Pesticides Subcommittee held on 19-20 June, 2017. Accordingly, the following decisions were approved at the 86th PeTAC held on 30th June 2017 in re-launching the following sulfonyl urea/ALS inhibitor herbicides in rice.

The following prospective recommendations were taken in order to improve effectiveness of use of sulfonyl urea/ALS inhibitor herbicides in rice;

1. Bispyribac-sodium 10% SC & 20% WP, Orthosulfamuron 50% WG & Propyrisulfuron 10% SC containing solo herbicide formulations were discontinued.

2. Only the ingredients of Pyrazosulfuron-ethyl 10% WP, Flucetosulfuron 10% WG, were allowed for marketing & using island wide.

3. Only the ingredients Fenoxaprop-*p*-ethyl 6.9% + Ethoxysulfuron-ethyl 2% OD, Azimsulfuron 50% WG were recommended only to the wet zone covering the districts of Colombo, Gampaha, Kalutara, Galle, Matara & Ratnapura.

All corresponding registrants were requested to amend their labels to reflect applicable recommendations and restrictions and to submit along with the farmer advisory prepared in Sinhala and Tamil languages for distribution. Each registrant was requested to print farmer advisories in Sinhala and Tamil languages as much as possible but not less than 25,000/product (in Sinhala) and 10,000/product (in Tamil) to be distributed through pesticides dealers and the extension staff. Necessary awareness through print media was also given on this.

Performing bio-efficacy trials on registered pesticides

All agricultural pesticides which are registered under the Act are re-tested for its bio-efficacy in every 6 years (Ref. Government *Gazette Extraordinary* No. 1870.63 dated 10.07.2014). In March 2017, the Office of the ROP initiated correspondence with the subject disciplined working group coordinators to streamline testing protocols and to avoid severe in-coordination between registrations of

pesticides and conducting bio-efficacy trials, in timely manner. In particular, the recently conducted Audit on pesticide management in Sri Lanka by the EU, European Union (Ref. (Ref. DG (SANTE)/2016-8787-MR Audit in Sri Lanka from 14-22 September 2016), the EU Auditors had distracted by the Pesticide Recommendation Manual (2010) and the Official List of Registered Pesticides, where some of the pesticides such as Deltamethrin, Quinalphos, Profenophos and Acephate were not harmonized. During the discussions had in this regard, the PeTAC was also concerned on the status of bio-efficacy trials on Deltamethrin, Quinalphos, Profenophos and Acephate, which had not been conducted by the research for several years and hence the relevant pesticide registrations procedures got languished; surprisingly, none of the pesticides were regulated for scientific reasons during the recent time.

If any of the pesticides shows unacceptable risks and/or poor performance by scientific evidence and deems it necessary to be discontinued, a decision may be taken by the Agricultural Pesticides Sub-committee in consultation with the Director General of Agriculture (DGA); so, it was decided that, the trials on any pesticides should not be discontinued, in perspective.

Upgrading the pesticide registration system in order to complement the definition of the Act

The present definition of “pesticides” includes product classified as “repellents” and “disinfectants” under various applications. The ROP initiated a discussion on a preliminary list of “gray products” of which required to be

regulated under the Act. The Office of the ROP receives applications for import/registration of products that are “non-conventional” or “products on par with the pesticide definition” or “repellents” with limited data submissions. The initial discussion prompted to a decision on whether the products to be assessed according to the requirements of the Act or to allow exemptions under the Act. The discussion has put forward for further comments at relevant subject-discipline sub-committees before a final decision is taken by the PeTAC.

Further discussions were carried out on plant growth regulators (PGRs) and the salient demarcations of PGRs between pesticide & non-pesticide categories. For example, 2,4-D is a PGR and if exceed the recommended dosage of a PGR, it could act as a pesticide. The existing mechanism of regulating PGRs is through a sub-committee of the DOA under the approval of the Director General of Agriculture. It has been highlighted that a clear separation of PGRs are needed for effective intervention of the subject where some plant protection products can induce resistance by means of elicitors and thereby the elicitors can increase the immunity of the crop against pests. The discussions are underway to assess PGRs through the Agro Pesticide Sub-committee and subsequent authorization under the Act. The ROP will act on the matter at the PGR sub-committee for further clarifications.

ANALYTICAL LABORATORY

Levy structure on laboratory testing

The analytical laboratory of the ROP has been accredited on ISO/IEC: 17025 by the Sri Lanka Accreditation Board with effect from 12

May 2017 for 3 years. Accordingly, the laboratory is competent in providing analytical services within the scope of accreditation (as per the mandate on compliance assessment and monitoring of pesticides) to the public. The fee structure was originally proposed as a notification by Gazette Extraordinary in line with the provisions given under the Section 23(2) of the Act, but later propositions dictated that the fee structure has to be approved as a Cabinet Memorandum and therefore, the draft Cabinet Memorandum was prepared in December 2017 for necessary approval. Meanwhile, the laboratory risk allowance is also applicable for the laboratory staff due to handling of toxic products and risks involved.

Accreditation road-show to ISO/IEC 17025:2005

- The initial assessment was held on 10.11.2016 and corrective actions taken for non-compliances raised during the assessment were submitted on 08.2.2017.
- 2nd revision of the quality manual was issued on 08.02.2017 and ISO/IEC 17025 accreditation was granted with effect from 19.05.2017.
- First surveillance assessment was carried out on 07–08 Dec. 2017 conducted by SLAB and no non-compliances were raised during the assessment. Revision 03 for the Quality Manual was issued on 20.11.2017.
- Training workshop on advance technologies in water analysis at Metrohm Application Centre, SAIF Zone, Sharjah,

UAE from 30.01.2017 to 01.02.2017 provided on-hand guidance for the laboratory staff.

The total scope of analysis of pesticide residues in fruits and vegetables including leafy-vegetables were included 26 contemporary active ingredients (e.g. Chlorothalonil, Captan, Diazinon, Tebuconazole, Profenophos, etc.) and 37 banned pesticide active ingredients including organochlorines (e.g. DDT, Aldrin, Endrin, Ethion, Dicofol, etc).

National pesticide residue monitoring program

Financial support of 17.25 million rupees was given for the proposed National Monitoring Program for the Pesticide Residue analysis for Fresh Fruits and Vegetables in Sri Lanka including Exported & Imported Consignments.

The analytical laboratories were selected with higher sensitivity of pesticide residues (LOD) than the default level of EU MRLs, 0.01 ppm. Samples were collected from Dedicated Economic Centres (DECs), farms and pack houses specially those who produce their products to the export market and Plant Quarantine Station of Katunayake Airport (Stocks to be exported and imported fruits & vegetables). The agricultural products were prioritized to represent local and exported consignments (e.g. the EU requirements). All samples were collected by following the CODEX sampling procedure. The overall assessment results (2016–2017) are shown in the Table 2.1.3.2 below.

Table 2.1.3.2: Pesticide residue detection rate & MRL exceedance rate on agricultural products (fruits & vegetables including leafy-vegetables) under EU Regulations.

Crop	Number of Samples analyzed*	Number & percent above the LOD and below the EU MRL	Number & percent above the EU MRL**
Tomato	30	20 (67)	10 (33)
Capsicum	29	17 (59)	12 (41)
Cabbage	27	19 (70)	08 (30)
Long bean	14	10 (71)	04 (29)
Ladies fingers	25	24 (96)	01 (04)
Snake Gourd	23	13 (57)	10 (43)
Chilli	15	09 (60)	06 (40)
Bitter gourd	39	37 (95)	02 (05)
Spinach	13	10 (77)	03 (23)
Brinjal	05	03 (60)	02 (40)
Gotukola	49	21 (43)	28 (57)
Mukunuwenna	28	17 (61)	11 (39)
Thampala	04	03 (75)	01 (25)
Kathurumurunga	09	06 (67)	03 (33)
Kankun	10	08 (80)	02 (20)
Thalana batu	02	02 (100)	0
Murunga	02	02 (100)	0
Kohila	01	01 (100)	0
Labu	01	01 (100)	0
Cucumber	06	06 (100)	0
Luffa	02	02 (100)	0
Pumpkin	01	01 (100)	0
Winged bean	09	09 (100)	0
Lunu mal	03	03 (100)	0
Mango	06	06 (100)	0
Papaya	08	06 (75)	02 (25)
Pineapple	03	03 (100)	0
Guava	03	03 (100)	0
Bell pepper	04	02 (50)	02 (50)
Potato	29	18 (62)	11 (38)
Onion	34	19 (56)	15 (44)
Bean	12	10 (83)	02 (17)
Thibbatu	02	01 (50)	01 (50)
Angunakola	02	02 (100)	0
Ash Plantain	03	03 (100)	0
Banana	02	01 (50)	01 (50)
Banana Blossom	01	01 (100)	0
Del	01	01 (100)	0

Crop	Number of Samples analyzed*	Number & percent above the LOD and below the EU MRL	Number & percent above the EU MRL**
Keedaram ala	01	01 (100)	0
Murunga kola	01	01 (100)	0
Raja ala	02	02 (100)	0
Wood apple	01	01 (100)	0
Orange	21	12 (57)	09 (43)
Grapes	03	01 (33)	02 (67)
Apple	12	05 (42)	07 (58)
Mandarin	01	0	01 (100)
Total	499	343 (69)	156 (31)

Notes: Detected Pesticides: Hexaconazole, Tebuconazole, Fenobucarb (BPMC), Diazinon, Thiamethoxam, Imidacloprid, Profenophos, Quinalphos, Captan, Novaluron, Acephate, Acetamiprid, Azoxystrobin, Buprofezin, Carbendazim, Etofenprox, Thiophanate-methyl, Thiodicarb, Bifenthrin, Pendimethalin, Oxyfluorfen, Chlorpyriphos, Prothiophos, Deltamethrin, Cadusafos, Phenthoate, Chlorothalonil, Fipronil.

Limit of Detection (LOD) = 0.01 ppm except Fipronil (0.005 ppm) & Tebuconazole (0.02 ppm)

The results showed that 69% of samples were not violated the most stringent pesticide residue levels declared by the EU; only 31% of samples were above the level of concern on EU MRLs. At this time, it cannot be ruled out that the detected residue are of health concern; however, there are indications that some crops are of concern on possible export rejection in the EU market, e.g. residue violations above 40% were Capsicum, Snake gourd, Chilli, Brinjal, Gotukola, Mukunuwenna & Bell pepper. Further characterization of pesticide residue levels (against locally approved MRLs)

will be required on imported commodities such as Orange, Grapes, Apple and Mandarin.

Table 2.1.3.3 shows a comparison of pesticide residue status of selected local agricultural products, on which CODEX (on which local MRLs have determined) and EU maximum residue levels (MRLs) have been declared. Accordingly, only 1 of 17 (5.9%) samples was marginally exceeding the CODEX MRL, while almost 59% (10/17) samples were exceeding the EU MRL values. Therefore, it can be safely mentioned that local agricultural products are within the safe limits of pesticides for human consumption.

Table 2.1.3.3: The status of pesticide residue violations on CODEX & EU MRLs in selected agricultural products

Crop	Name of Pesticide	EU MRL (mg/kg)	CODEX MRL (mg/kg)	Residue Detected	Violations (EU MRLs) (/No)	Violations (CODEX MRLs)
Bean	Chlorfluazuron	0.01	05	0.05	Yes	No
Bell Pepper	Mancozeb	0.01	01	0.01	No	No
Bitter Gourd	Profenophos	0.01	03	0.01	No	No
Brinjal	Chlorantraniliprole	0.02	0.6	0.03	Yes	No
Cabbage	Profenophos	0.01	01	0.05	Yes	No
Capsium	Fipronil	0.02	0.2	0.05	Yes	No
Chilli	Profenophos	0.01	03	0.01	No	No
Mango	Imidacloprid	0.005	01	0.01	Yes	No
Onion	Chlorfluazuron	0.05	02	0.05	No	No
Potato	Mancozeb	0.01	0.2	0.05	Yes	No
Pumpkin	Profenophos	0.01	03	0.01	No	No
Snake Gourd	Profenophos	0.02	03	0.01	No	No
Tomato	Chlorantraniliprole	0.02	0.6	0.06	Yes	No
Cabbage	Tebuconazole	0.01	01	0.05	Yes	No
Apple	Tebuconazole	0.01	01	0.07	Yes	No
Snake Gourd	Profenophos	0.01	0.05	0.02	Yes	No
Potato	Fipronil	0.02	0.02	0.05	No	Yes
Total Violations (EU MRL) %					10/17 (59%)	
Total Violations (CODEX MRL)%					1/17 (5.9%)	

Detection & reporting of counterfeit pesticides by FTIR for legal purposes

Counterfeit and illegal fake pesticides present real risk to farmer's health, the environment and the economy. The FTIR (Fourier-transform infrared spectroscopy) has been instrumental in number of ways to track illegal pesticides and to monitor significant adulteration of products. The Custom Case No: PREV/2017/252/CCR/1318 for illegal importation of 32,000 liters of Glyphosate formulation as organic silicon was confirmed by FTIR instrument. Further, six field samples

(ROP/UN/17/138,140,141,142,144 and 145 were also identified as Glyphosate. Several samples from Mundalama police case dated 23.03.2017, two samples from Dimbulapatana Glyphosate inspection of MOIB-170/129 PR/146/2017, five samples from Puttlam Willowsate® Glyphosate investigation and three samples from Anuradhapura were also identified as Glyphosate and issued analytical certificates for investigative assistance. The ROP is the process of developing a reference database ("fingerprint") for registered pesticides for subsequent monitoring of the quality of consignments.

POST-REGISTRATION ACTIVITIES & FIELD MONITORING

Compilation of a pesticide dealer database

It has been constantly challenged that devoid of a properly maintained and updated Pesticide Dealer Database (PDD) at the Office of the ROP has hampered effective decision making and compliance monitoring in the implementation of the Act. There had been number of occasions in the past that the Auditor General's Department has questioned the slow progression with respect to the pesticide dealer registration as per the requirements of the Act.

In the light of the above, the Office of the ROP initiated to compile complete information on pesticide dealers islandwide in July 2017. The necessary inputs for the Pesticide Dealer Database (PDD) were requested from Provincial/ Inter-Provincial/ Mahaweli Regions in order to ensure that data requirements are much more interactive and user-friendly for administrative and legal purposes.

The overall status of dealer licensing & inspections

Pesticide dealer licenses are valid for one year unless cancelled for specific reasons. Such

licenses valid for one-year are renewed throughout the year depending on the date of issue and other circumstances. A fee of Rs. 550.00 is charged as a part of the regulatory requirements for issuing the annual license. Total revenue realized under this category was Rs. 558,850.00. The number of dealer shops licensed was 1,021.

The number of pesticide dealer shops inspected by the Officers from Office of the ROP during the year 2017 was 45. The investigators were found in some shops during inspections. The shop owners were advised to upgrade the conditions of the shops and relevant AuOO were informed at the same time to follow up. The Office of the ROP has been concerned about certain lapses in conductance of pesticide businesses such as poor ventilation in stores, stocks of expired products, not neatness of arranging the products in the stores, delay in obtaining pesticide sale certificates and availability of unregistered products of household category, etc. In a memorandum dated 12.12.2017 to the Director General of Agriculture by the ROP recommended establishing a sub-committee to monitor field implementation progress and other related functions under the Act.

Table 2.1.3.4: District-wise number of pesticide sales shops available and the number of shops registered up to 31.12.2017.

District	No. of shops available	No. of shops registered	Progress %
Ampara	137	135	98.5
Anuradapura	118	31	26.3
Badulla	156	93	59.6
Batticaloa	61	-	-
Colombo	47	44	93.6

District	No. of shops available	No. of shops registered	Progress %
Gampaha	24	17	70.8
Galle	91	53	58.2
Hambantota	51	41	80.4
Jaffna	43	33	76.7
Kalutara	-	07	-
Kandy	145	68	46.9
Kegalle	73	09	12.3
Kurunegala	354	104	29.4
Mahaweli- C	11	11	100.0
Mahaweli- (Emb)	-	41	-
Mahaweli- G	21	12	57.1
Mahaweli- H	-	21	-
Matale	43	22	51.2
Matara	111	19	17.1
Mannar	-	-	-
Moneragala	33	23	69.7
Mullativu	-	-	-
Nuwara Eliya	173	88	50.9
Polonnaruwa	41	41	100.0
Puttlam	110	21	19.1
Rathnapura	127	74	58.3
Trincomale	33	13	39.4
Vavuniya	19	-	-
Vanni	-	-	-
Total	2022	1021	50.5

Training of pesticide dealers

All pesticide dealers are required to obtain the National Vocational Qualification (NVQ) level IV competency certifications as per the regulations imposed under the Control of Pesticides (Sales and Supply) No. 01 of 1999 (Government Gazette Extraordinary 1716/23 of 27.07.2011). As pursuant to the above requirements, the Office of the ROP collaboratively conducts regular dealer training programs with the district level Authorized Officers. Agrochemical Sales & Technical Assistants (ASTA) training was given to 89 dealers during the year 2017. As a bridging

program, 355 dealers were certified after necessary trainings for sales certification purposes through one-day trainings.

The final assessments for the trainees of those who have completed the ASTA training in 2016, were held in 25th January and 26th October, 2017. The total number of certified ASTA trainees was 893 as of December 2017.

Active coordination with Authorized Officers nominated under the Act

The greatest challenge in the implementation of field regulation of pesticides in recent times

was poor coordination with Authorized Officers (AuOO) nominated under the Section 21 of the Act. There are 117 Authorized Officers as of December 2017 and proper coordination is essential to implement field regulations effectively. In 2017, the Office of the ROP conducted four regional meetings of the AuOO. In order to build up confidence among AuOO relating to legal actions, lecture by Senior State Counsel from the Attorney General's Department on "*How to handle a court case under the Control of Pesticides Act*" was conducted in the meeting held on 7th November 2017 at DATC, Vavuniya.

Challenges & issues related to the illegal import of Glyphosate

All Glyphosate containing products have been cancelled from registration and stop-sale regulations were issued by the government Gazette Extraordinary No. 1937/35 dated 23.10.2015. The ROP created a momentum to seek strong collaboration with the Sri Lanka Police, Department of Customs, Sri Lanka Navy and the Special Task Force for detecting cases of illegal pesticides, filing up court cases and conducting investigations.

In January 2017, Director General of Customs was requested to take thorough vigilance with reference to the contravention of the above provisions.

As a result, several cases have been inquired and investigated by the Department of Customs and mitigation forfeitures were taken on illegal consignments.

Three court cases were filed in the year 2017 and the details of them are given below:

Table 2.1.3.5: Details of court actions against illegal pesticides during 2017

Date	Court & case Number	Accused	Decision
2017/07/04	95486/17 Anuradapura	N. Nilantha Munidasa	Fined Rupees 75,000.00 on 20.10.2017
2017/07/20	17178/17 Dehiaththak andiya	Keerthi Sri Ravinatha Wickraman ayaka	Fined Rupees 50,000.00 on 16.03.2017
2017/10/30	36198/17/P2 Puttlam	Mohomad Hasan Abdul Gani	Fined Rupees 100,00.00 on 30.10.2017

Pesticide samples are cross-screened as a mean of compliance verification for the FAO quality standards before issuing of packing clearance on consignment basis.

Ethylene thiourea (ETU) in Mancozeb, Maneb, Metiram containing products and propylene thiourea (PTU) in Propineb containing products are significant impurities formed during manufacturing and subsequent decomposition. Therefore, product quality parameters have been established.

As a compliance monitoring action to check whether the impurity and moisture contents are within the specifications, the Office of the ROP conducted sample tests in an independent/accredited laboratory on

representative consignments of Mancozeb, Maneb, Metiram and Propineb containing products for ETU/PTU impurities and for moisture content.

In addition, the circular issued in August 2017 on Quality Control of Mancozeb, Maneb, Metiram & Propineb Fungicides declared additional precautionary actions to be followed strictly in processing all Mancozeb, Maneb, Metiram and Propineb containing product consignments as a complementary measure. The complementary measure included the assurance of moisture proof packing materials, necessary sealing and monitoring procedures during the packing, humidity controlled re-packing and storage facilities, and ambient temperature control and use of inner-liners for packing & re-packing.

As a routine practice, 235 packing & market clearances were issued during the year after quality analysis of samples on consignment basis. The scope of analysis was subjected to the current capacity stated in this report, elsewhere.

New rules for submission of Quality Certificates (QC) for obtaining import permits

Currently QC are checked on each and every consignment of pesticides before granting import approvals for quality assurance. Accordingly certain documents were strictly required and adhered to the requirements in a standard QC, at the time of application for import licenses.

In consequent to the comments received from the pesticide industry, the PeTAC granted acceptance for the following alternative

mechanisms to strengthen the quality assurance of pesticides.

1. Submit quality certificates generated from an Independent Accredited Laboratory as per the given specifications under relevant accreditations once a year (According to same rule of submission of heavy metal analysis reports practiced at present)
2. Submit quality certificate for each consignment with specified parameters generated by the own laboratory within formulation facility of the manufacturer/formulator/ supplier.

OTHER

Laboratory conducted/ supervised research activities

- Analysis of contaminant levels of selected heavy metals in rice in Kandy district. 68 samples were analyzed for heavy metals. Results indicated that 98% of rice samples (imported, traditional, local branded and locally-grown) did not exceed the provisional tolerable daily intake when calculated by mean values of Mercury, Arsenic, Cadmium, Selenium and Lead. 12% of rice samples exceeded provisional tolerable daily intake when calculated by maximum values of Lead (in imported and traditional rice) and Selenium (in imported rice).
- Analysis of pesticide residues in fruits and vegetables exported to the European Union and determination the effect of chlorine treatment on Diazinon residues.
- Analysis of contaminant levels of selected heavy metals in Mahaweli River water, Sri Lanka. 84 water samples from 15

locations along the Mahaweli River were collected and analyzed for heavy metals

- Analysis of pesticide residue levels in fruits and vegetables for the National Pesticide Residue Program - 100 fruits and vegetable samples were analyzed for pesticides residues and compared with local MRLs published.

Removal of bulk use of pesticides when there is sufficient number of alternatives

As per the discussion had in its 86th meeting of the PeTAC held on 30.06.2017, and in consequent to the concerns raised over the escalating use of Profenophos (which has been implicated for uncontrolled misuse & residue concerns), which is a highly hazardous pesticide formulation belongs to the WHO Hazard Class II, the matter was referred at the 26th Agro-Pesticides Sub-Committee held on 26.10.2017. The sub-committee suggested reducing the import quantity by 50% in average of 6 consecutive years, and restricting the recommendation for gall fly control in cucurbits until such time suitable alternatives are tested and recommended. In accordance with the decision taken at its 89th meeting of the PeTAC held on 29.12.2017, the applicable quota (i.e. 50%) for Profenophos 50% EC formulations for the interim period would be 100 kiloliters (maximum) based on import averages of 203 kiloliters of Profenophos 50% EC for the last 6 consecutive years.

In addition, in order to safeguard the public, future regulatory control and for international references, following regulatory determinations were taken for implementation.

- 1) Regulatory notification of Azinphos methyl, Binapacryl, Chlorobenzilate, Dinitro-ortho-cresol, Dinoseb, 1,2-dibromoethane, Ethylene dichloride, Fluoroacetamide, Hexachlorobenezene, Toxaphene, Tributyl-tin compounds, Benomyl to the Rotterdam Convention as banned pesticides in Sri Lanka.
- 2) The chemicals listed in Annex III include pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by two or more Parties and which the Conference of the Parties has decided to subject to the PIC procedure.
- 3) Notification of Chlorpyriphos 40% EC, Profenophos 50% EC & Abamectin 1.8% EC to the Rotterdam Convention as severely hazardous pesticide formulations under the conditions of use in Sri Lanka.
- 4) Regulatory notifications of de-registered pesticides of Oxydemeton-methyl, Triadimorph, Trichlorfon, and 2,4-D as banned pesticides in Sri Lanka.

The draft texts were presented to the legal draftsman in August 2017 under the cancellations made under Sub-section (1) of Section (11) and notified by order under Sub-section (4) by the ROP under the Act, as approved by the PeTAC at its 85th meeting held on 21.04.2017.

Implementation of safety kits for pesticide application

To mark the initiative, a PPE distribution program was launched for farmers on 09.03.2017 by the Hon. President at Wilgamuwa (Hettipola).

Empty pesticide container management in Sri Lanka

Haphazard disposal of empty pesticide containers is a serious environmental issue. An empty container collecting mechanism has been established and in operation since last year. Field collection is done by the Crop Life, Sri Lanka. Two field collection campaigns along with necessary awareness were conducted in collaboration with the Crop Life, Sri Lanka in Puttlam/ Chilaw and Nuwara-eliya/ Welimada areas during 21–22 June, 2017 and 21–22 September 2017, respectively. A total of 138–full load of polysac bags of empty glass and plastic containers were retrieved from the field during the campaigning periods and over 1.5 tons of glass container thus collected were processed for recycling through M/s Piramal Glass Co. (Pvt.) Ltd.

Management of obsolete pesticides and legally confiscated stocks of pesticides

As of December 2016, estimated 26 metric tons of obsolete pesticides were accumulated in government farms and research institutions of the DOA. The preliminary discussions prompted the Office of the ROP to maintain a secure storage facility at the DOA.

As a result, the storage facility at the Field Crop Research and Development Institute (FCRDI), MahaIluppallama has been serving as a secure option for management of obsolete pesticides.

During the year 2017, 19 regional institutions of the DOA were inspected and 807 kg of solid pesticides and 270 l of liquid pesticides were stored. Adding up to the initial amount of 0.4 metric tons in stock, altogether approximately

a stock of 1.47 metric tons of obsolete pesticides has been stored in secure manner at the above facility.

The above storage facility has also been instrumental for storing legally confiscated pesticides in the court of law under the Act in secure manner. In this year, 68 kg of solid pesticides and 406 l of liquid pesticides were acquired for secure storage from court proceedings and the remaining 588 kg of solid pesticides and 809 l of liquid pesticides are pending submission by court actions (thus, the entire stock of legally confiscated pesticides was about 1.87 metric tonnes as of December 2017).

Chemical policy coordination & international participation

The eighth meeting of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (RC COP8), and the eighth meeting of the Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants (POPs) (SC COP8) convened from 24th April–5th May, 2017 in Geneva, Switzerland was attended.

Sri Lanka specifically acknowledged & appreciated the support & the opportunity given on information sharing at the recent workshops held in Thailand (Asia and Pacific regional preparatory meeting of the 2017 conferences of the parties to the Basel, Rotterdam & Stockholm conventions – Bangkok, Thailand, 6–8 March, 2017) and Indonesia (APPPC Sub–regional Training Workshop for the Designated National Authorities on the Rotterdam Convention

Focussing on Increasing Notifications March 13–17, 2017, Surabaya, Indonesia) on increasing notifications under the Rotterdam Convention and its remarkable impetus to report over actions taken recently on prohibiting a number of pesticides and some formulations in Sri Lanka.

The following officers from the Office of the ROP represented at chemical review meetings on the assessment of pesticides proposed under the Conventions.

- Dr. J.A. Sumith (Registrar of Pesticides) represented at the Persistent Organic Pollutant Review Committee (POPRC) under the Stockholm Convention (Term: May 2014–May 2018).
- Ms. Champa Magamage (Assistant Director of Agriculture, Research) represented at the Chemical Review Committee (CRC) under the Rotterdam Convention (Term: May 2017–May 2020).

National database on pesticide residues & maximum residue levels in agricultural products

There have been concerns over local food safety while highlighting the necessity to formulate a *National Pesticide Residue Monitoring Program* for food safety in Sri Lanka. Currently, analytical facilities for detecting pesticide residues in various matrices are being developed at the Office of the ROP and currently *ad hoc* residue monitoring activities are being carried out with a very narrow scope with the existing staff.

Before June 2017, the Government *Extraordinary Gazette* No. 433/9 of 24.12.1986 has been the only official declaration of time limits (days) between the

use of a pesticide on the food crop (Pre-harvest Intervals, PHIs) and the harvest of the food crop (days 7–21) and corresponding maximum regulatory limits of MRLs (mg/kg) of any residue of a pesticide, in such crop may contain. The initial list contained PHIs and corresponding MRLs for 13 insecticides of generic use and has become obsolete over the years. In June 2017, as the chair of CODEX sub-committee on safe food initiatives under the Control of Food Act No. 26 of 1980, vested with his mandate to declare safe limits of pesticides in agricultural products under the Act, the ROP was able to declare through the Government *Extraordinary Gazette* No. 2023/34 of 14.06.2017, a finalized list of MRLs for common pesticides based on regional/ international and CODEX Alimentations MRLs and the listing included 221 MRLs for 39 crop/food categories on 66 pesticide active substances.

Out of 110 agricultural pesticide active ingredients in use, in order to complement with broader residue profiling in local, imported and exported agricultural products, the external services of accredited analytical laboratories (ISO/IEC 17025: 2005) were explored (based on competitive bid selection).

Request of information of the rules and norms regulating the quality and safety of imported grains and its products by foreign countries

Official communications were made with the Russian Embassy through the Ministry of Agriculture with respect to the provisions to quality control of agricultural products in Sri Lanka. The Office of the ROP is officially bound to declare relevant national standards of

pesticides, i.e. Maximum Residue Limits, on which the necessary national MRLs have been published in the Government *Gazette Extraordinary* Notification No. 2023/34 dated 14.06.2017 for 66 locally registered pesticides.

EU Audit & follow up actions

In response to the audit in Sri Lanka to Evaluate Control of Pesticides in Food of Plant Origin Intended for Export to the European Union during 12–23 September 2016 (Ref. DG (SANTE)/2016–8787–MR), necessary follow up activities as identified by the EU Audit team were incorporated in the action plan as follows:

- Conducting pesticide residue monitoring program in fruits & vegetables
- Publishing pesticide recommendations for leafy vegetables
- Priority for registration of pesticides with shorter pre-harvest intervals (PHI).

Reports submitted

Report on pesticide risk reduction-submitted to the Parliamentary Public Accounts Committee. 22nd September 2017.

Awards received

The best presenter award to Ms. P.W.Y. Lakshani for the paper on “Pesticide residue in selected vegetables in several growing areas by GC/MS using QUECHERS technique” at ASDA 2017.

Cease of agrochemical operations by M/s Mackwoods (Pvt.) Ltd.

As a result of winding up of agrochemical operations by M/s Mackwoods (Pvt.) Limited, the ROP pre-demanded follow up

actions/commitments by the Company in order to safeguard human health & the environment resulted by expired/outdated pesticide stocks owned by the company.

Suspension of pesticide licenses issued under the Act: M/s Polychemex (Pvt.) Ltd.

As a result of the actions on or before the 31st August, 2017, all the licenses issued on pesticides under the Act to M/s Polychemex (Pvt.) Ltd. was suspended for two years on the advice of the 87th PeTAC held on 31st August 2017. This action was taken under the Section 11 of the Act. However, the full implementation of the suspension decision was affected by the subsequent revocation decision at the 89th PeTAC held on 29th December 2017, in response to an appeal made to the Secretary/ Ministry of Agriculture. Therefore, the decision was stayed and then vacated before its full implementation.

PLAN FOR 2018

Pesticides Registration

- Acceptance of applications for new and re-registration
- Evaluation of technical dossiers for new and re-registrations
- Preparation of new and re-registration certificates
- Pesticides Technical & Advisory Committee (PeTAC) meetings
- Pesticides Sub-Committee Meetings (Agricultural Pesticides Sub-Committee, Domestic & Public Health Pesticides Sub-Committee, Industrial Pesticides Sub-Committee)

- Dialogs with the pesticide industry & other stakeholders
- Coordination of pesticide evaluation by the DOA (on bio-efficacy)

Awareness on all relevant target groups, assurance of safe use & judicious marketing of pesticides, collecting & compilation of pesticides related data

- Media programs and exhibition
- Training / Certification of Agrochemical Sales & Technical Assistants (ASTA) and dealers
- Awareness programs for Authorized Officers & Enforcement Officers
- Publishing revised guidelines for registration of pesticides/guidelines for registration of pesticide companies
- Collection, compilation and dissemination of import statistics (Central Bank, Universities, Researchers, Govt. Institutions, etc.)

Compliance monitoring (Product quality and residues in environmental compartments & action against violation of the Act)

- Issue of import permits
- Issue of sample import approvals
- Evaluation of quality certificates on consignment basis
- Screening of labels for approval
- Screening of advertising materials for approval
- Inspection of formulation factories
- Inspection of pesticides impurities
- Inspection of approved repacking facilities & stores
- Inspection & certification of premises of fumigation & house-hold pest control service providers

- Development & implementation of programs for empty pesticide container management & disposal
- Registration of pest control services
- Approval of CH₃Br for quarantine & pre-shipment treatment on accountable basis
- Issue of restricted pesticide use permits (excluding CH₃Br) for pest control services
- Inspection of pesticide sales outlets
- Handling of field complaints
- Action taken on violation of the Act & legal prosecutions
- Issue of dealer training certificates
- Issue of dealer certificates by Authorized Officers
- Dispatch of samples to MRI & other research institutes for obtaining test reports on suitability for acceptance of applications
- Issue of packing clearance as per the quality analysis of samples on consignment basis
- Establish a compliance monitoring scheme to assure the levels of pesticide residues in vegetables, fruits & water
- Analysis of heavy metals in food and water
- Formulation analysis
- Acceptance of test reports for suitability (bio-efficacy & heavy metal reports)
- Evaluation notifications send by the European Union (EU) (on pesticides residues)
- Residue analysis data base under EU Audit

Participation as technical experts/ members/ resource persons for intra & inter-departments, ministries, institutions, etc.

STAFF LIST

Designation	No. Approved	No. Existing
Registrar of Pesticides	01	-
Principal Scientist (Toxicology)	01	-
Deputy Registrar of Pesticides	01	-
Assistant Director of Agriculture (Research)	08	05
Assistant Director of Agriculture (Development)	02	02
Research Assistant (Special Grade)	01	-
Agriculture Monitoring Officer	02	01
Program Assistant (Agriculture)	02	02
Development Officer	04	04
Agriculture Instructor	06	07
Research Assistant	07	07
Public Management Assistant	05	05
Technological Assistant	03	01
Driver	03	03
Storeman	01	01
Research Sub Assistant	01	-
Office Employee	01	01
Watcher	02	01
Labourer	05	05
Labourer (Contract)	02	02
Total	58	46

2.1.4 PLANT GENETIC RESOURCES CENTER (PGRC) - GANNORUWA

The objective for establishment of the Plant Genetic Resources Centre (PGRC) is to collect, conserve to enhance and utilization the diversity of crop genetic resources. The PGRC continues its efforts to explore, collect, introduce, conserve, evaluate and document the genetic diversity of food crops and their related species in order to achieve this. The Biotechnology Unit of the Centre mainly

involves in molecular characterization, *in vitro* conservation and cryopreservation of plant genetic resources. A total of 15,110 accessions of crop germplasm are currently conserved at the seed gene bank in the PGRC and 250 accessions conserved *in vitro*.

This report presents a summary of the progress achieved by the PGRC in the year 2017.

BUDGET

Table 2.1.4.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	9,733,973	9,440,112	97
Capital	9,530,000	8,682,497	91
Projects			
• National Food production program (NFPP)	1,000,000	984,040	98
• Asian Food and Agriculture Cooperation Initiative (AFACI)	1,740,000	1,727,706	99
• National Agricultural Research Plan (NARP)	1,194,643	1,205,623	101
• Biodiversity for Food and Nutrition (BFN)	27,997,000	27,876,850	100
• Biodiversity Adaptation for Climate Change (BACC)	665,000	643,831	97
Total	51,860,616	50,560,659	97

PROGRESS

Germplasm Exploration and Collection

The Exploration Unit of the PGRC continued its activities to collect plant genetic resources

of crops including their wild relatives (Table 2.1.4.2).

Table 2.1.4.2 Number of germplasm samples collected through explorations and received from research institutes

Crop Group	No. of samples collected	No. of Samples received from research institutes
Rice	57	82
Vegetable	180	17
Grain	27	10
Maize	06	-
Oil crops	04	27
Root and tubers	34	31
Other	04	51
Total	312	217

Conservation of Seed Materials

The Seed Conservation Unit of the PGRC is engaged in cold storage of germplasm and distribution of samples for utilization. During the year 2017, a total of 703 new accessions

were conserved in the gene bank. In addition, 335 multiplied accessions were conserved. Total number of gene bank holdings at the end of the year was 15,110 (Table 2.1.4.3).

Table 2.1.4.3: The present conservation status of the gene bank

Crop Group	No. of Accessions
Rice and related spp.	5243
Other cereals and related spp.	1853
Grain Legumes	2290
Vegetable Legumes	1739
Solanaceous vegetables & Condiments & related spp.	1472
Cucurbit vegetables	901
Brassicaceae vegetables	31
Alliums	21
Other vegetables	480
Leafy-vegetables	202
Root and Tubers	09
Mustard and related spp.	140
Oil crops	467
Fiber crops	67
Medicinal plants	30
Fruits	165
Total	15,110

Distribution of germplasm

During 2017, a total of 846 accessions of different crop varieties were distributed to farmers, research stations, non-governmental organizations (NGOs) and universities on request (Table 2.1.4.4).

Table 2.1.4.4: Distribution of germplasm in 2017

Institute	No. of samples distributed
Universities	89
Research institutes	295
Farmers and individuals	224
Other institutes	238
Total	846

Research on seed behavior

Seeds of following crops (viz. Maize, Sorghum, Finger millet, Foxtail millet, Cowpea, Green gram, Yard long bean, Hyacinth bean, Solanum spp., ‘Elabatu’, Tomato, Pumpkin, Cucumber, ‘Kekiri’, Amaranthus) conserved in 1985, 1990 and 1991 were tested for viability. Among these crops, Maize, Sorghum, ‘Kekiri’, Cowpea, ‘Elabatu’, Pumpkin Foxtail millet and Solanum spp. showed decreased viability and other crops showed more than 85% germination.

Germplasm multiplication

Following crop germplasm samples were multiplied and submitted for conservation.

Table 2.1.4.5: Total number of accessions multiplied and submitted in 2017

Crop	Scientific name	No. of accessions
Amaranthus	<i>Amaranthus</i> sp.	04
Ash pumpkin	<i>Benincasa hispida</i>	01
Kathurumurunga	<i>Sesbania grandiflora</i>	01
Pigeon pea	<i>Cajanus cajan</i>	01
Bitter gourd	<i>Momordica charantia</i>	24
Black gram	<i>Vigna mungo</i>	41
Alanga	<i>Ipomoea alba</i>	01
Brinjal	<i>Solanum melongena</i> (L.)	29
Chilli	<i>Capsicum</i> sp.	66
Mustard	<i>Brassica juncea</i>	01
Common Bean	<i>Phaseolus vulgaris</i> (L.)	47
Cowpea	<i>Vigna unguiculata</i> (L.)	82
Cucumber	<i>Cucumis sativus</i> (L.)	01
Finger millet	<i>Eleusine coracana</i> (L.)	04
Foxtail millet	<i>Setaria italica</i> (L.)	91
Green Gram	<i>Vigna radiata</i> (L.)	02
Groundnut	<i>Arachis hypogaea</i>	09
Horse Gram	<i>Macrotyloma uniflorum</i> (L.)	11
Kekiri	<i>Cucumis melo</i> (L.)	02

Crop	Scientific name	No. of accessions
Lima bean	<i>Phaseolus lunatus</i>	01
Luffa	<i>Luffa acutangula</i>	25
Maize	<i>Zea mays</i>	04
Mustard	<i>Brassica juncea</i>	01
Okra	<i>Abelmoschus esculentus</i> (L.)	129
Penala	<i>Cardiospermum halicacabum</i>	01
Pumpkin	<i>Cucurbita maxima</i> (L.)	01
Red Onion	<i>Allium cepa</i> (L.)	07
Rice	<i>Oryza sativa</i> (L.)	34
Sesame	<i>Sesamum indicum</i>	04
Yardlong Bean	<i>Vigna unguiculata</i> (L.)	87
Snake Gourd	<i>Trichosanthes cucumerina</i> (L.)	10
Sorghum	<i>Sorghum bicolor</i> (L.)	89
Soybean	<i>Glycine max</i>	20
Spinach	<i>Spinacia oleracea</i>	04
Sun flower	<i>Helianthus annuus</i>	01
Tomato	<i>Lycopersicon esculentum</i> Mill.	33
Velvet bean	<i>Mucuna pruriens</i>	01
Winged bean	<i>Psophocarpus tetragonolobus</i> (L.)	29
Total		899

Germplasm characterization and evaluation

Under this program, conserved Chili, Sorghum and Okra accessions were characterized using

morphological descriptors. Promising accessions of Chili and Okra were selected for yield evaluation.

Table 2.1.4.6: Number of germplasm characterized and evaluated in 2017

Crop	Scientific Name	No of Accessions characterized/ evaluated	No of accessions selected
Sorghum	<i>Sorghum bicolor</i> (L)	89	-
Chilli	<i>Capsicum</i> sp.	66	05
Okra	<i>Abelmoschus esculentus</i> (L.)	129	20
Total		284	25

Characterized data were handed over to the Data Management Unit for inclusion in the plant genetic resource database.

Maintenance of Banana germplasm

196 banana accessions are maintained from 19 different cultivars.

Biodiversity for Food & Nutrition

Project - BFN

The BFN project funded by the GEF has been implementing with the goal of mainstreaming biodiversity conservation and sustainable use for improved human nutrition and well-being. It is implemented under three major components; (1) increasing knowledge base, (2) strengthening policy, regulatory frameworks and markets, and (3) awareness raising. The following contributions were made under the project:

The assessment of the baseline status of agro-biodiversity, dietary diversity and associated traditional knowledge was completed in three selected pilot sites; Giribawa, Udukumbura & Niunhella with implementation of recommendations. The BFN project completed collection of existing data and the nutritional composition analysis of 58 varieties/land races of 28 species of priority/local agricultural species with a national nutrition database and website established for food and nutrition.

A policy brief on achieving food and nutrition security was disseminated to respective policy embodying bodies.

New marketing options and guidelines for agro-biodiversity and food with high nutritional value were identified and developed with recommendations and guidelines were drafted with extensive surveys and focus group discussions in partner with the Agribusiness Centre.

Ethno-botanical studies for underutilized edible plant species of Sri Lanka were commenced with completion of data collection. Several awareness programs have been conducted to raise awareness and up-scale utilization and marketing of agro-

biodiversity at BFN pilot sites including home garden diversification targeting 50 households with relevant trainings and workshops per pilot-site and implementation of food & diversity fairs. At the national level several activities were completed to promote the utilization of food biodiversity for human nutrition; establishment of model gardens, establishment of traditional rice, local root, tuber & vegetable cultivations increasing small-holder growers contributing to sustainable supply chains (Aranayka-70, Niunhella-70, Udukumbura-50 farmers/households); under-utilized fruit model gardens (1 Uwa-Wellassa University and 2 schools); self-employment program for women for use of nutritious herbal food and beverages, recipe booklet on “Nutritious Herbal Food and Beverages with medicinal value”.

Multiple media approach to promote conservation & utilization on local agro-biodiversity for improved human nutrition & wellbeing with the completion of several information events; production & broadcasting of TV and radio advertisements, upgrading ‘Hela Bojun’ outlets. A national food festival was held 16th October 2017, commemorating the world food day, with the island wide cooking competitions, discussion forums, seminars and street dramas.

Mainstreaming Agro-Biodiversity Conservation and use in Sri Lankan Agro- ecosystems for Livelihoods and Adaptation to Climate Change Project (BACC)

Objective of this project was to introduce, multiply and make available of traditional

genetic resources to three selected agro-ecosystems for the adaptation to climate change. Some key performance activities are as follows:

Participatory variety selection programs were held at the PGRC research field in collaboration with researchers and farmers from three project sites. During the program, farmers shared their field experiences and traditional knowledge regarding okra cultivation. Five traditional Okra accessions were selected for Farmer Field Fora (FFF). Based on the farmer request, traditional cultivars of different vegetable species were multiplied and introduced to project sites to expand the crop diversity.

Bio-diversity fair was held at Udukumbura project site to evaluate the crop and species diversity prevailing in the project site in collaboration with farmers, extension officers, Department of Ayurveda, and Faculty of Veterinary Sciences. Documentation of crop diversity was initiated by establishing Community Biodiversity Registers (CBR) in each project site.

Establishment of community seed banks in each project site were initiated to promote on-farm conservation of traditional crops. Farmers were aware of the community seed bank concept, and discussions were carried out with farmers regarding traditional seed conservation methods and conservation duration using such methods.

Biotechnology

Development of a mini-core collection of traditional varieties

This work was carried out to identify representative accessions, each from 11

commercially important traditional varieties (Sudu heenati, Kalu heenati, Suwandel, Pachchaperumal, Kruluthuda, Madathavalu, Pokkali, Suduru samba, Murungakayan, Weda heenati, Herathbanda) based on seed morphology and molecular characterization using Simple Sequence Repeat (SSR) primers. Representative accessions on each variety were identified. The information will be useful for authentication of traditional varieties for conservation, use and seed certification for commercial cultivation.

Phenotypic and molecular characterization of rice germplasm for drought tolerance

The project was funded by the National Agricultural Research Plan (NARP) and the objective of this study was to identify drought tolerant accessions based on phenotypic and molecular characterization data for development of drought tolerant lines. *Oryza cchingari* showed the highest drought tolerant characters while traditional cultivars; Goda heenati, Alwee, Podiniyan wee were identified as drought tolerance based on phenotypic characterization. The recommended variety Bg 300 also showed drought tolerant characters. Gene expression analyses were done for 3 gene markers and trait association was carried out for drought-linked traits.

Molecular characterization of *Annona* germplasm

The genetic diversity assessment was conducted using 14 ISSR markers for accessions of *Annona muricata* available at the Agriculture Research Station, Girandurukotte, Fruit Research and Development Institute, Horana, Fruit Research Stations, Gannoruwa

& Ambatenna. The samples were also collected from a major sour sop orchard in Badulla together with locations such as Jaffna, Peradeniya, Avissawella, Kegalle, Gampola, Medawala and Kundasale. Altogether, 50 samples were used to assess the genetic diversity and data analysis is in progress. The information generated in this research is useful for selection of unique genotypes with desirable commercially and agronomically important characters. The project was funded by the NARP.

Tagging of Yellow Vein Mosaic Virus (YVMV) resistant genes in wild Okra

A research project was initiated to tag the resistant genes in wild okra using molecular techniques to incorporate YVMV resistant character from wild okra species (*Abelmoschus angulosus*) to popular Okra variety MI-7. The inheritance study revealed that the disease resistance in wild Okra is governed by two recessive genes in an additive manner. The molecular analysis was done using 75 RAPD primers; three polymorphism RAPD primers were identified. The SCAR marker development is in progress. This project was funded by the National Research Council (NRC).

Analysis of Genetic Diversity of *Nai miris* (*Capsicum chinense* Jacq.) Using Simple Sequence Repeat (SSR) Markers

A study was carried out to identify the genetic diversity of *Nai miris* germplasm conserved in the seed bank at the PGRC. Field evaluation was completed on 25 accessions of *Nai miris* germplasm with two *Capsicum annum*, two *C. frutescens* and one *C. baccatum* accessions. The molecular characterization was done using

22 SSR markers. Cluster analysis grouped these accessions into three groups based on the genetic distance. All 'Nai miris' accessions grouped into one cluster. Some miss identified accessions were corrected based on genetic analysis results. This study will be useful in 'Nai miris' cultivar selection programs and conservation activities. This is an IMPGR funded research project.

Morphological and Molecular characterization of selected *Dioscorea* accessions for analyzing diversity and duplicates

A study was carried out to analyze genetic diversity and to identify duplicates among selected *Dioscorea* accessions conserved in the PGRC. Field evaluation, morphological and molecular characterizations were done on selected 80 *Dioscorea* accessions. The genetic diversity identified in this study will be useful for breeding programs and conservation activities. This is an IMPGR funded research project.

Conservation and maintenance of plant genetic resources of *Dioscorea*, sweet potato, potato and banana under *in vitro* and planthouse conditions

According to the PGRC mandate, the objective of this program was to conserve and maintain crop germplasm, specially root and tuber crops and vegetatively-propagated crops. A total of 242 accessions consisting of 106 sweet potato, 80 *Dioscorea* spp., 16 potato, 20 banana and 21 'Innala' accessions were conserved *in vitro* while sweet potato, *Dioscorea*, banana and innala were maintained in the planthouse and in the field.

***Dioscorea* micro tuberization as a tool for long-term conservation and planting material production (NARP Project)**

The objective of this research was to study the feasibility of conservation of *Dioscorea* using micro-tubers. The *in vitro* conditions for micro-tuberization and tests on conservation conditions in *Dioscorea* were investigated. The *in vitro* tuberization media were developed for 04 accessions and tuber regeneration conditions are being testing. Harvested tubers from Acc. 11, 29 and 117 were kept under three temperature levels to identify the storage period.

Mutation induction in *Dioscorea*

This research was conducted to develop mutants with altered plant architecture. In order to achieve this, plantlets were produced *via* chemical mutagenic agents. The plantlets produced were acclimatized but there were no any mutated character identified up to this stage.

Cryopreservation of fruit crop germplasm

The objective of this study was to develop protocols on long-term conservation of fruit crop germplasm under ultra-low temperature (-196 °C) conditions. The cryopreservation unit was established. This is the first attempt to cryopreserve crop germplasm in Sri Lanka. Under this program, the initial conditions for cryopreservation were investigated. Moisture levels for cryopreservation of Banana, Papaya and Citrus were identified.

Plant Genetic Resources (PGR) Information Management System

Presently, the database contains passport data of 14,839 accessions and characterization data of 25 crops including Rice, Maize, Finger millet, Foxtail millet, Sorghum, Cowpea, Mung bean, Black gram, Soybean, Pigeon pea, Groundnut, Bean, Winged bean, Yard long bean, Brinjal, Tomato, Capsicum, Okra, Pumpkin, Snake gourd, Bitter gourd, *Amaranthus*, Smooth luffa, Mustard and Sesame.

A survey was conducted to collect data on fruit trees conserved at research stations and other institutes of the Department of Agriculture. Information on fruit trees including the GPS coordinates (longitude and latitude) was recorded. The information on 1700 fruit trees was compiled in a database maintained at the PGRC.

Training and awareness programs

Training and awareness programs were conducted by the PGRC on conservation of plant genetic resources. Many farmer groups were also visited to gain knowledge on conservation of plant genetic resources (Table 2.1.4.7). Especially, four farmer groups were selected from Raigama, Bandaragama, Gampaha, and Dehiathakandiya areas and were trained on the advantages of PGR conservation and community gene bank development. More than one hundred important germplasms were collected by the farmers.

Table 2.1.4.7: Number of training programs conducted at the PGRC

Training programs	No. of participants
University Students	400
Agriculture Diploma students	624
In-plant training students	38
School children	2,401
Teachers	400
Other officers	100
Farmer groups	260
DOA and other departments	230
Research student	06
Total	4,459

Undergraduate research

- Study of Genetic Diversify of different “Murungakayan” rice accessions (*Oryza sativa* L.) based on the seed morphology and genetic variations
- Genetic diversify analysis of traditional rice varieties “Sudu Heenati” and “Weda Heenati” using SSR Markers.
- Genetic diversity of traditional rice cultivar, “Herath Banda” (*Oryza sativa* L.) based on morphological and molecular characterization.
- Development of cryopreservation protocol for banana variety-“Embul” (*Musa* spp.) using vitrification technique
- Development of cryopreservation protocol for banana variety “Pulathisi” (*Musa* spp.) by droplet vitrification technique
- Development of protocols for cryopreservation of sour orange (*Citrus aurantium*) shoot tips by encapsulation-dehydration
- Inter and intra species genetic diversity of *Vigna* based on morphological characterization

- Effect of antibiotics on contaminated *in vitro* potato accessions

PLAN FOR 2018

- Exploration and collection of Plant Genetic Resources (PGR) of traditional varieties, recommended varieties, other genetic stocks and crop wild relatives
- Conservation, maintenance and distribution of PGR
- Multiplication of different crop germplasm
- Characterization, evaluation and genetic analysis of germplasm
- Development of mini core collection of traditional rice varieties
- Analysis of Genetic Diversity of ‘Nai miris’ (*Capsicum chinense* Jacq.) using Simple Sequence Repeat (SSR) Markers
- Morphological and Molecular characterization of selected *Dioscorea* accessions for analyzing diversity and duplicates
- Diversity assessment of wild *Vigna* species
- Conservation and maintenance of plant genetic resources of *Dioscorea*, sweet potato, potato and banana under *in vitro* and plant house conditions
- Protocol development for Cryopreservation
- Field evaluation and morphological characterization of Sweet Potato
- Continuation of activities for conservation of Plant Genetic Resources.
- Continuation of distribution of Plant Genetic Resources.

- *Dioscorea* micro-tubers as a tool for long term conservation and planting material production

STAFF LIST

Designation	No. Existing
Additional Director	01
Assistant Director of Agriculture	04
Information & Communication Technology Officer	01
Program Assistant (Agriculture)	02
Development Officer	03
Agriculture Instructor	03
Research Assistant	05
Public Management Assistant	07
Technological Assistant	03
Driver	04
Tractor Operator	01
Store man	01
Electrician	02
Technician	01
Research Sub Assistant	03
Circuit Bungalow Keeper	01
Lorry Cleaner	01
Peon	01
Watcher	04
Laborer	32
Laborer (Contract)	08
Total	88

2.1.5 NATIONAL PLANT QUARANTINE SERVICE (NPQS) – KATUNAYAKE

The mandate of the National Plant Quarantine Service (NPQS) of Sri Lanka is to facilitate the import and export of pest-free plants and plant-products, for the development of agriculture and related industries in the country. To achieve this, emphasis was given to both research and service-oriented quarantine activities. Phytosanitary certification, inspection and treatment of import and export plants and plant-products, testing of detained plant products, Pest Risk Analysis, field certification for fruits and vegetable and pack house registration and sampling, issuing of import permit for plants and plant-products, dissemination of knowledge on all aspects of plant quarantine via training and awareness

programs for interested groups (national research institutes, universities, institutes and centers of DOA) are the main activities. During the year 2017, technical divisions of the NPQS have identified many pests of regulatory concern during tests done on imported commodities and some of them are highly regulated to prevent entering to the country due to its predicted noxiousness. Therefore, the NPQS was able to protect the country from alien pest invasions (Table 2.1.5.1).

This report gives the achievements made on financial, technical and service-oriented activities carried out during 2017.

Table 2.1.5.1: Avoidance of pest introduction to Sri Lanka through the action taken by the NPQS. (These pests were detected and their entry was avoided)

Technical Division	Number of tested imports	Detected pests
Weed Science	123 (Miscellaneous)	<i>Brassica tournefortii</i> , <i>Galium aparine</i> , <i>Lactuca scariola</i> , <i>Argemone ochroleuca</i> , <i>Convolvulus arvensis</i> , <i>Polygonum</i> sp., <i>Chenopodium album</i> , <i>Euphorbia dentate</i> , <i>Ambrosia trifida</i> , <i>Polygonum cuspidatum</i> , <i>Bromus</i> sp., <i>Cuscuta</i> sp., <i>Polygonum convolvulus</i> , <i>Picris echioides</i>
Pathology	26 (Seed Potato)	<i>Streptomyces reticulissabies</i> and <i>Spongospora subterranea</i> sub sp. <i>subterranea</i>
Airport unit	26	<i>Thrips</i> spp., <i>Pieris rapae</i> , <i>Trichoplusia</i> spp., <i>Leucinodes orbonalis</i> , Family – Diaspididae, <i>Anthracnose</i> spp., <i>Erwinia</i> spp.,

BUDGET

Allocation given and expenditure incurred under recurrent, capital and projects are given in Table 2.1.5.2.

Table 2.1.5.2: Annual budget –2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	9,813,779	9,863,530	101
Capital	8,700,000	6,565,670	75
Projects			
• Food Production National Program - 1	12,000,000	11,645,184	97
• Food Production National Program - 2	10,000,000	9,745,731	97
• National Agriculture Research Projects	2,350,000	2,336,430	99
• Development of <i>gamma</i> -irradiation treatment standards to control fruit fly species (e.g. <i>Bactrocera dorsalis</i>) of export potential fruit of Sri Lanka	3,700,000	3,690,532	100
• Mass rearing of biological insect pest control agents for the control of Cabbage & Tomato pests (Preliminary step for establishment of insect pest control infirmary in Sri Lanka).	4,000,000	3,954,000	99
Total	50,563,779	44,410,545	95

PROGRESS

PLANT QUARANTINE OPERATION DIVISION

Activities carried out by the Plant Quarantine Operation Division within the year 2017 are listed in the Table 2.1.5.3.

Table 2.1.5.3: Activities carried out in 2017

Activity	Achievements
01 Registration of interceptions	399
02 Number of interception reports sent	398
03 Registration of inspections	1,481
04 Number of inspection reports sent to entry points	1,380
05 Registration of coir products for testing	476
06 Reports for tested coir products	407
07 Registration of imported seed potatoes for testing	24
08 Reports for tested seed potatoes	24
09 Registration of submitted samples for testing	55
10 Field certification for EU exports	301
11 Number of import permits were issued	4,472
12 Registration of Korean net houses	02

Except for these activities which are related to the plant quarantine operations, the division has coordinated and carried out 22 comprehensive training programs on plant quarantine activities and procedures for various stakeholders (Undergraduates/ diploma & school students/ teachers/ exporters/ importers etc). For strengthening the capacity building of plant quarantine officers, 08 training and awareness programs were conducted at the NPQS. In addition to that provided information related to pest status and agronomic practices on some crops to destined countries to carry out pest risk analysis as the initial steps to prevent introduction of pests.

ENTOMOLOGY DIVISION

Testing for insect pests, mites, nematodes in exports and imports consignments

a) Exports

- 13,396 export foliage plant samples were collected from 30 export foliage nurseries and tested for plant parasitic nematodes; 68 samples were found to be infested with plant parasitic nematodes.
- 17,356 export foliage plant samples were tested for insect pests, snails and mites; 46 samples were found to be infested.
- 302 export coir samples were collected from 27 coir factories and tested for insect pests, mites and plant parasitic nematodes; 01 sample was found to be infested with insects.
- 34 other special samples submitted by the foliage exporting nurseries, fruit and vegetable fields and coir factories were tested for plant parasitic nematodes and

insect pests to monitor pests; none of the samples were found to be detected with harmful organisms.

b) Imports

- 26 imported seed potato consignments were inspected at the Sea Port; 81 representative samples were collected and were tested for insect pests and plant parasitic nematodes; none of the samples were found to be infested with harmful organisms.
- 708 imported plant materials including hybrid Maize, Groundnut, Cashew nut, Cocoa cake, Lemon fine cut, Cardamom seeds, rubber wood, Mucuna seed, tampico fiber, hybrid rice, *Sphagnum* peat moss, fermented cocoa beans, moringa seeds, rye grass, fresh ginger, grape seed, cherry stone seed, black pepper, eggplant, agar wood seed, button mushroom etc. were tested for insect pests, mites and plant parasitic nematodes; 15 samples were found to be infested with common stored pests.

c) Trainings

A large number of students belong to the universities, technical colleges and schools were trained under the Entomology Division.

d) Research programs

- Development of Gamma-irradiation treatment standards to control fruit fly spp. (*Bactrocera dorsalis*) of export-potential fruits of Sri Lanka.

- Identification of present status of insect pest infestation of export-oriented leafy-vegetable fields.

PATHOLOGY DIVISION

Main activities of the division focus on testing for pathogens in exports and imports consignments.

a) Exports

- **Foliage and coir**

As a whole 12,255 export foliage/coir samples were collected from 476 foliage nurseries and coir factories and tested for plant pathogens; 02 samples were rejected on found to be contaminated and rejected (Table 2.1.5.4).

Table 2.1.5.4: No. of consignments with high contamination of pathogens

Pathogen	No of samples/ consignments	Action Taken
<i>T. paradoxa</i>	35	01 rejected
		28 released after treatment
<i>Geotrichum</i> spp.	31	Released after treatment
<i>Colletotrichum</i> spp.	07	Released after treatment
<i>Rhizoctonia</i> spp.	01	Rejected

- **Tissue culture plants**

A total of 216,845 tissue culture samples were collected from 85 export foliage nurseries/laboratories and tested for plant pathogens; 03 samples were rejected due to contamination with plant pathogens (*Erwinia chrysanthemi*, and *Erwinia carotovora* sub sp. *carotovora*).

- **Food, Fruits and Vegetables**

Inspections were carried out on 11 samples and all were in acceptable condition.

b) Imports

- **Seed potato**

A total of 81 samples of seed potato were collected through 26 inspections (from the Sea Port, Colombo); 03 lots/consignments of seed potato were contaminated with *Streptomyces reticulissabies* and *Spongospora subterranean* sub sp. *subterranean* and were rejected.

- **Seed and planting material**

As a whole, 54 samples were tested for plant pathogens and they were found to be free from harmful pathogens.

- **Food**

261 samples were tested and all were in acceptable condition.

- **Miscellaneous**

70 samples were tested and all were in acceptable condition.

c) Submitted samples testing

A total of 23 samples were tested.

d) Training programs

During the year, 14 training programs (one day trainings) were conducted by the NPQS and the Pathology Division has been engaged in these programs. Long term trainings were conducted for 21 students who have been engaged in in-plant trainings of various academic institutions.

e) Research programs

- Investigation of the presence of fungal and bacterial contaminations in export coir consignments
- Identification and characterization of causal agent of soft rot in *Aglaonema* spp. by biochemical and molecular means and introduction of suitable control measures.
- Investigation of presence of *Pantoea stewartii* in imported maize.
- Detection of potato viruses (PVY, PVM PVS, PLRV and PVX) in imported seed potatoes by serological methods.
- Molecular Identification of *Clavibacter michiganensis* sub sp. *sepedonicus* associated with imported seed potatoes.

WEED SCIENCE DIVISION

a) Testing of export consignments

- **Coco peat**
A total of 370 consignments consisting of 488 types of products were tested;

Out of the products tested, 66 samples were found to be contaminated with weeds or soil.

- **Grains and spices**

A total of 151 commodities belong to 45 consignments were tested during the first & second-quarter of the year until April 2017; No samples were submitted or no consignments were inspected by this division after May 2017.

- **Plants for planting**

25 consignments, which consisted of more than 1770 commodity types were inspected and tested for any weed or soil contaminations; 01 consignment was failed the tests due to the presence of soil.

b) Testing of imported consignments

- **Seeds for planting**

123 imported consignments were tested and out of them 11 were found to have contaminated with quarantine weeds. Three consignments were released on conditional basis since they were pre-coated with a fungicide-nutrient-mixture and the importers were instructed to grow them in restricted places, under close supervision of the Weed Science Division to avoid possible introduction of harmful weeds.

- **Grains**

39 different consignments were tested including cardamom, black pepper, dill seeds etc, and out of them 04

consignments were failed the laboratory tests due to presence of quarantine weeds.

- **Other commodities**

20 different commodities including tampico fiber, mushroom media, animal feed etc. were tested for the presence of weed seeds; one consignment was failed

the test due to the presence of harmful weed species.

Weed Species detected in the consignments and their regulatory status is indicated in the Table 2.1.5.5. The consignments that were contaminated with regulated weeds were not allowed to be released to the consignee.

Table 2.1.5.5: Weed Species detected in the consignments

Species	Regulated status	Crop
<i>Brassica tournefortii</i>	Regulated	B-Onion, Mustered, Cauliflower
<i>Galium aparine</i>	Regulated	Carrot, Grass seeds, Cauliflower
<i>Lactuca serrriola</i>	Regulated	B-Onion, Dhal, Bermuda grass, Beet
<i>Argemone ochroleuca</i>	Regulated	Soya bean, Carrot, Radish, B-Onion
<i>Convolvulus arvensis</i>	Regulated	B-Onion
<i>Polygonum sp.</i>	Regulated	B-Onion, Carrot
<i>Chenopodium album</i>	Regulated	Carrot, Cauliflower
<i>Euphorbia dentata</i>	Regulated	B-Onion
<i>Ambrosia trifida</i>	Regulated	Soybean
<i>Polygonum cuspidatum</i>	Regulated	B-Onion, Radish
<i>Bromus sp.</i>	Regulated	Bermuda grass, Pulses
<i>Cuscuta sp.</i>	Regulated	<i>Brassica sp.</i>
<i>Polygonum convolvulus</i>	Regulated	B-Onion, Soybean, Beet
<i>Picris echioides</i>	Regulated	Carrot

c) Submitted samples

- Plant samples were submitted by various sectors, such as environmentalists, government sector institutions such as Ministry of Health, Provincial/ Municipal Councils, Ministry of Environment and other institutes of the Department of Agriculture, Various exporters and importers etc. to get confirmation on the taxonomy and noxiousness of plants suspected as noxious weeds.

37 such samples were tested during 2017. In addition, 135 different species from 187 samples collected during field surveys were identified and their risk status was confirmed.

d) Regulatory activities

- **Weed Risk Analysis**

87 rapid Weed Risk Analyses were performed for plant species that were requested to import into the country,

including *Ageratum* sp., *Dichondra* sp. *Hypericum* sp. etc.

- **Post- entry quarantine**

During 2017, post entry quarantine studies were conducted for 14 *Echinodorus* species, *Bambus abalcoa* and few other bamboo species which were imported to Sri Lanka.

e) Training and awareness

Training and awareness programs were conducted as follows: 03 awareness programs for local and foreign delegations and visitors, 07 groups of agriculture extension officers, one day training for 14 groups (students and undergraduate groups), long term training for 20 students who engaged in in-plant training at the NPQS and exporters on phytosanitary quality assurance of commodities, certified by the Weed Science Division. In addition, 2 undergraduates were completed their undergraduate research with the Weed Science Division.

f) Research

A total of 6 research studies were performed on the following subjects:

- Identifying early germination characters that lead a plant species to become an invasive species
- Evaluation of the efficiency of DNA barcodes in taxonomic identification of novel alien plant species
- DNA barcoding as a tool to identify regulated weeds

- Potential penetration of exotic aquatic plants to natural environment through ornamental plant industry
- Taxonomic identification of *Abutilon* (Family Malvaceae) based on morphological characters: a reference for Plant Quarantine operations
- Evaluation of the efficiency in separating contaminant weed seeds from B-Onion seeds using colour sorting.

g) Surveys and surveillances

One survey was conducted on aquatic and semi-aquatic weeds in vicinity to the aquatic plant export industries located in the North Western and Western Provinces.

h) Reference collections

Weed Science Division maintains three reference collections: weed seeds, herbarium and live aquatic plants.

The Weed seed collection was upgraded with 37 different weed species, the herbarium collection with 58 new specimens and the live aquatic plant collection with 11 new species.

BIO SECURITY AND INTERNATIONAL RELATIONS DIVISION

Following are the main activities performed by the Biosecurity Division and the progress achieved in 2017.

a) Pest Risk Analysis for exports

Initiation of a new trade activity with another country for an agricultural commodity

requires confirmation on phytosanitary status of the exporting country. The exporting country has to make a formal request to the NPPO of the importing country on the export of new commodity. Then the exporting NPPO has to provide the details on the industry, associated pest risk and the local methods of pest risk management.

Within the year of 2017, the division was able to establish new trade relationships for -

- Dragon fruits, Guava, Passion fruits, Mangosteen, Sour sop and Rambutan with Australia,
- Pineapple and Dragon fruits with China,
- Pineapple for New Zealand
- Processed Wheat with China
- Rice and rice flour with Chile

b) Pest Risk Analysis for imports

When a new commodity is imported to Sri Lanka, the associated pest risk needs to be analyzed upon which the development of import requirements will be done. During the year 2017, 27 rapid pest risk analyses were performed.

c) International Cooperation

- Sri Lanka came in to an agreement with the Government of Chile on import of Blueberries and Boldo leaves to Sri Lanka and export of rice and rice flour to Chile.
- 56 official communications were made with diverse countries on import requirements, export requirements, treatment requirements, phytosanitary non-compliances and authenticity of the phytosanitary certificates.

- 55 Phytosanitary non-compliance notifications and 12 RASFF (Rapid Alert System for Food and Feed) notifications on food safety issues received from EU were communicated to relevant stakeholders enabling corrective measures.
- Commenting on 11 new and amended ISPMs on behalf of Sri Lanka
- 08 complete pest risk analyses were performed on import of cut flowers, import of Boldo leaves and Blueberries from Chile, import of coconut kernels, import of peat moss from Ireland, import of soybean meal from Brazil, import of asparagus as a vegetable and import of Blueberry plants from Japan.

TREATMENT TECHNOLOGY

DIVISION

The main activities of the treatment technology division include:

- Providing fumigation services for the exporters (on export consignments) & importers (on intercepted consignments).
- Pre- and post-fumigation inspections of export consignments of plants and plant products.
- Registration of heat treatment providers under International Standards for Phytosanitary Measures 15 (ISPM 15).
- Auditing of heat treatment providers.
- Regulating methyl bromide consumption for QPS purposes under Montreal protocol and sharing the information with Ozone Unit/ Ministry of Environment.
- Joint system review audit for registered methyl bromide treatment providers

under Australian Fumigation Accreditation Scheme (AFAS).

- Conducting awareness programs for treatment providers and other stakeholders.
- Participating international forums related to quarantine treatment and sharing information with the other partner countries which are organized by Department of Agriculture & Water Resources, Australia (Quarantine regulation meeting 2017, Laos) and Government Partnership for Development Program 2017, Indonesia.
- Providing opportunities for in-plant training to diploma holders and university students and research projects for undergraduates.
- Research work pertaining to the NARP project on “Development of treatment standards for Vapormate® and Liquid Phosphine for quarantine and non-quarantine fumigation for plant and plant-products.

a) Fumigation Service for exports consignment:

As the phytosanitary requirements of the importing countries, methyl bromide fumigations were carried out for 30 consignments of plants and plant-products exported from Sri Lanka during the year 2017 (Table. 2.1.5.6).

Table 2.1.5.6: Commercial fumigations for export consignments done at the NPQS, Katunayake during 2017

Commodity type (exports)	No. of fumigations
Coir and coir product	23
Wood and wooden items	04
Others	03
Total	30

For the imported consignments, to fulfill the import phytosanitary conditions of intercepted consignments, 08 consignments were fumigated at the NPQS (Table.2.1.5.7).

Table 2.1.5.7: Commercial fumigations for import/ intercepted consignment at the NPQS, Katunayake during 2017

Commodity type (imports)	No. of fumigations
Cut flowers	06
Wood and wooden items	01
Spices (Cardamom)	01
Total	08

To indicate the treatment details in the phytosanitary certification, 306 export consignments were fumigated by the accredited treatment providers under the supervision of the NPQS to strengthen the phytosanitary process (Table 2.1.5.8).

Table 2.1.5.8: Fumigated consignments on commodity-wise under the NPQS

Commodity	No. of consignments
Coir	230
Spices	50
Food stuff	15
Others	11
Total	306

b) Regulation of methyl bromide consumption under Montreal Protocol

Since Sri Lanka is a signatory to the Montreal Protocol, usage of methyl bromide is allowed only for quarantine and pre-shipment purposes. To comply with Montreal Protocol all the requests made by the exporters are examined by the Treatment Technology Division. During the year 2017, 8,306 requests were examined for suitability of methyl bromide fumigations and on-line approvals were given to carry out methyl bromide fumigations. Four requests were rejected since they were not relevant to QPS (Quarantine and Pre-Shipment) purposes.

c) Activities on heat treatment facility

The streamlining of registered treatment providers under ISPM 15 were continued and registration of three new treatment facilities were done under ISPM 15.

d) Training / awareness Program:

- An awareness program on the regulation and use of methyl bromide for QPS purposes was conducted for treatment providers, exporters, importers, shipping-lines and government officers at the Hector Kobbakaduwa Agrarian Research and Training Institute, Colombo in collaboration with the National Ozone Unit of the Ministry of Environment, Sri Lanka.
- A training on fumigation and fumigation of grain stores for the newly-appointed pest management group of the

Department of Agriculture was conducted at the In-service Training Institute (ISTI), Anuradhapura.

e) Joint system review audit for registered methyl bromide treatment providers under Australian Fumigation Accreditation Scheme (AFAS)

Registered fumigation companies under AFAS were audited in collaboration with the Department of Agriculture, Australia and all the companies got acceptance to comply with AFAS for the year 2017.

f) Providing opportunities for in-plant training to diploma holders and university students and research projects for undergraduates

- Seven groups of diploma students were trained on Quarantine treatments.
- One undergraduate researcher was trained and carried out the research program at the Treatment Technology Division and the research thesis has been selected to be submitted to the International Research Symposium, Uva Wellassa University, 2018.

g) Research Activities & Outputs

Studies were carried out to introduce Liquid phosphine as a quarantine treatment and treatment standards were developed to eliminate the following pests:

- **Fruit flies in export quality**

- **Mangoes**

- Liquid Phosphine (EO2FUME®) @ 100 g/m³ (2 g PH₃ /m³ or 1,400 ppm PH₃) with 24-h exposure period was found to be effective as a quarantine treatment / post harvest disinfestations/for the control of fruit fly in Mango while maintaining the fruit quality.

- **Melon flies in export quality Bitter gourd**

- Liquid Phosphine (EO2FUME®) @ 100 g/m³ (2 g PH₃ /m³ or 1,400 ppm PH₃) and 24-h exposure period was found to be effective as quarantine treatment/ post harvest disinfestations/ for Bitter gourd.

- **Grain pest in milled rice**

- Liquid Phosphine (ECO2FUME®) @ 50 g /m³ (1 g PH₃ /m³ or 700 ppm PH₃) and 36-h exposure can be recommended for weevil control in milled-rice.

- Research paper based on this title was accepted by the International Research Symposium, Uva Wellassa University.

**PLANT
QUARANTINE STATION
(PQS) –AIRPORT,
KATUNAYAKE**

Main services of this unit are inspection and clearance of imported plant and plant-products, inspection and issuance of phytosanitary certificates for exporting plant and plant-products. The total revenue of Plant Quarantine Station of Bandarnayake International Airport, Katunayake (PQS-BIA)

is mainly from export and import inspection charges and issuing phytosanitary certificates. The annual total revenue of 2017 was Rs. 9,456,495.00 and the total number of phytosanitary certificates issued was 58,828 with an earning of Rs. 704,936.00. The total number of export and import inspections carried out during 2017 was 58,339 with an earning of Rs.8,750,850.00.

Exports

Table 2.1.5.9: Exported Consignments during 2016 & 2017

Commodity	2017	2016
Cut Foliage	4,986	5,239
Live plants	1,367	1,450
Unrooted cuttings	111	70
Rooted cuttings	51	80
Fruits	14,191	14,549
Vegetables	18,708	17,685
Coconut	494	865
Tea	5,834	5,959
Aquatic plants	143	135
Coir	744	693
Betel	5,774	5,457
Fresh Flowers	204	226
Spices	930	636
Tobacco	166	121
Coconut oil	250	369
Others	384	426
Wooden items	65	43
Coconut-products	595	251
Seeds	06	11
Rice	04	22
Rubber	01	0
Wheat flour	0	06

Table 2.1.5.10: Exported Quantity during 2017

Commodity	Pieces/ L	kg
Fruits	0	7,297,375
Vegetables	0	9,152,193
Coconut	0	82,919.48
Tea	0	435,065.9
Betel	0	4,747,569
Spices	0	137,000.3
Tobacco	0	534,576.2
Coconut oil	76.8326	157,791.2
Others	330,399/8.35	257,709.6
Wooden Items	3,257	4,095.06
Coconut-Products	2,200/166.12	176,427.5
Seeds	0	134.215
Foliage	123,405,001	12,260.5
Live plants	24,202,610	10,776.67
Cut-flowers	124,760	663.95

Table 2.1.5.11: Internal Rejections of fruits and vegetables intended for the EU countries

Commodity	kg
Okra	35,829.1
Mangosteen	3344
Kathurumurunga leaves	3,007.6
Nivithi	2,910.5
Drumstick leaves	3,121.5
Thalana Batu	2,798.8
Brinjal	2,477.33
Onion flower	2,443.3
Yams	1,549.4
Amaranthus	1,509.4
Mukunuwenna	1,306
Gotukola	1,178
Mango	1,137.8
Long beans	1,103.19
Snake gourd	836

Commodity	kg
Curry Mango	827.3
Rambutan	470.9
Papaya	568.3
Banana	473.95
Winged beans	341.8
Thibbatu	420.9
Bitter gourd	281
Pineapple	228
Capsicum	225.5
Turmeric	184
Anguna kola	158.9
Anoda	109
Onion	328
Green Chilli	90
Guava	86.3
Ridged gourd	81.7
Rampe	76
Wood Apple	73.8
mix leaves	66.25
Thumba Karawila	58.5
Curry Leaves	55.5
Betel Leaves	55
Beans	28
Kankung	23
Bread fruit	21
Others	143
Total	70,027.52

a) Imports

Most of the plant and plant-products imported through airfreight are perishables and most of them come as air cargo. Only a little quantity is brought by and only few come with air passengers. The total imports in the year 2017 were around 183.374 mt and 3,074,423 nos. Live plants including orchid, Adenium etc. fresh flowers such as roses, dried-herbs,

fresh fruits, vegetables and vegetable seeds were the common imports.

b) Detained Commodities at the Passenger Terminal

These commodities are mainly brought with no phytosanitary certificates or import permit causing a biosecurity risk to the country. The PQS-BIA was detained around 6,502.774 kg and 2714 pieces of plant-products including mainly fresh fruits, fresh flowers and spices. The detained items were subjected to destruction at the NPQS under the supervision of the Sri Lanka Customs.

Other than inspection and phytosanitary certificate issuance, this unit also supports the promotion of phytosanitary standards of Sri Lankan exports by conducting training and awareness programs for exporters, school and university students and government officers etc. Auditing of certified fields, pack-houses and foliage nurseries are also done by the Officers of PQS-BIA in collaboration with the NPQS staff. The PQS-BIA has contributed the maximum support for further improvement of prevailing phytosanitary certification system of Sri Lanka by initiation of electronic systems such as e-phyto of the International Plant Protection Convention and the single window systems operated by the Sri Lanka Customs.

PLANT QUARANTINE STATION (PQS) - SEAPORT, COLOMBO

Plant Quarantine Station at Seaport, Colombo is a major entry and exit point of Sri Lanka through which almost all the export and

import consignments including plants and plant-products of bulk quantities are exchanged. Tea, Rubber, Coconut-based products, spices and food-stuff are major export items and seeds as planting material, fruits, timber, animal feed and all the other commodities for consumption such as chilies, dhal, coriander, potato, onion etc. are the major imports having plant quarantine concerns.

Progress

No.of PSC issued	:	43,605
Income from PSCs:		Rs.523,260
No. of cargo inspection	:	43,026
Income from inspections:		Rs.6, 453,900
Total income:		Rs.6, 977,160
Total No. of export consignment:		38,492
Total quantity:		1,499,744.23 mt
Total No. of import consignment:		25,769
Total quantity:		2,412,924 mt
Total no. of destructions:		08
No of treatments :		44

PLANT QUARANTINE STATION – GANNORUWA

The activities carried out by this Unit during 2017 includes, issuance of Phytosanitary Certificates, inspection of nurseries and providing instructions, pre- and post-fumigation inspection of export consignments of tobacco and biological control research work pertaining to the National Food Production Program (NFPP) project.

National Food Production Program

Mass rearing of biological insect pest control agents for the control of Cabbage and Tomato

pests (Preliminary step for establishment of insect pest control infirmary in Sri Lanka).

Progress

- Three parasitoids of diamond back moth were identified.
- Thirty-five artificial diets were formulated and tested out of which three diets were found to be suitable for mass rearing insects in the laboratory.
- Based on the results, posters and handouts were prepared for the exhibition at the BMICH on “Thirasara Sanwardhanaya Jathika Mangallaya”.
- More than 30 parasitoid releases were carried out in Kandy, Nuwara Eliya and Anuradhapura Districts in an area of about 50 ha.
- Fifteen awareness creation programs were conducted at Kandy, Nuwara Eliya and Anuradhapura Districts.
- During the year, 244 Phytosanitary Certificates were issued and 25 Nursery inspection visits and 12 field inspection visits were undertaken and necessary instructions were given. Further, 52 pre- and post-fumigation inspections on tobacco exports by CTC, Mawilmada were carried out.
- Supervision of Plant Quarantine Section of the Agro Technology Park of the DOA.

PLANT QUARANTINE STATION – AIRPORT, MATTALA

A total of 09 factory inspections were conducted and 09 samples were tested for

plant pathogens and insect pests. Final reports were submitted to entry-points and only one PSC was issued.

- Participated in two-days technical sessions at the NPQS (Katunayaka) on quarantine aspect of imports and exports of plant and plant-products
- Participated in ten training programs about all technical aspects of general agriculture, conducted by ISTI, Gannoruwa and ISTI, Agunakolapellessa.

PLAN FOR 2018

Promotion of export of quality plants and plant-products

- Export nursery inspections
- Factory inspection of export plants & plant products
- Other agriculture related export inspections (individual tissue culture plant evaluation)
- Sampling
- Document check
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Laboratory testing weeds/soil
- Submission of final test reports

Ascertaining the quality of imported seed potato

- Entry point inspection of seed potato
- Sampling
- Document check
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Submission of final test reports

Ascertaining the quality of imported plant and plant products

- Entry point inspection
- Sampling
- Document check
- Receipt of samples submitted by entry points to the NPQS
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Laboratory testing weeds
- Submission of test reports
- Submission of final test reports
- Release
- Treatment recommendation
- Re-export or destruction

Ascertaining the quality of imported seeds

- Entry point inspections
- Sampling
- Document check
- Receipt of samples submitted by entry-point to the NPQS
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Laboratory testing weeds
- Submission of test reports
- Submission of final test reports
- Release
- Treatment recommendation
- Re-export or destruction

Prevention of imports without fulfilling phytosanitary requirements

- Document check
- Sampling

- Receipt of samples submitted by entry points to the NPQS
- Testing for pathogens in intercepted plants
- Testing for insect pests in intercepted plants
- Testing for plant parasitic nematodes
- Testing for weeds
- Submission of test reports
- Submission of final test reports
- Treatment recommendation
- Treatment supervision
- Re-export
- Destruction

Post Entry Quarantine

- Field inspection
- Keeping plants at DOA premises
- Recommendations
- Submission of final reports

Treatment for eradication of pests found in export and import plants and plants products

- Fumigation at the NPQS
- Supervision of fumigation done outside the NPQS
- Issuance of fumigation reports
- Online approval for fumigation companies

Maintenance of reference collections

- Weed species and weed seed species
- Insects
- Disease specimens
- Live aquatic plants

Training and awareness programs for stake holders

- Trainings
- Supervision of undergraduates/Diploma students
- Awareness programs
- Workshops
- Seminars

Quarantine related research

- Pest surveys
- Pest Risk Analysis
- Weed control research
- Pathological research
- Entomological research
- Quarantine treatment research

Registration of plant nurseries, fruit & vegetable fields & pack-houses

- Exporting plant to designated countries
- Field inspections
- Factories and pack houses
- Auditing
- Submission of reports

Evaluation of facilities available with treatment providers

- Inspection of sites
- Auditing
- Submission of reports

Issuing of Import permit and phytosanitary certificates

- Establishment of electronic phytosanitary certificate issuance system.
- Introducing a new certificate with improved security features to avoid documentary forging.

- Import and export documentary clearance process will be integrated to Customs ASYCUDA system.

STAFF LIST

NPQS, Katunayake

Designation	No. Existing
Additional Director	01
Deputy Director	01
Assistant Director of Agriculture (Research)	05
Assistant Director of Agriculture (Development)	04
Administrative Officer	01
Agriculture Monitoring Officer	02
Program Assistant (Agriculture)	05
Research Assistant	09
Agriculture Instructor	19
Technological Assistant	05
Technological Assistant (Engineering)	01
Public Management Assistant	06
Driver	04
Electrician	01
Office Employee	01
Watcher	05
Special Laborer (Sanitary Contract)	01
Laborer (Permanent)	08
Laborer (Contract)	11
Total	91

PQS, Airport, Katunayake

Designation	No. Existing
Deputy Director of Agriculture (Development)	01
Assistant Director of Agriculture (Development)	03

Designation	No. Existing
Agriculture Instructor (Supra grade)	01
Agriculture Instructor	24
Research Assistant	05
Technological Assistant	19
Public Management Assistant	02
Laborer (Permanent)	03
Laborer (Contract)	03
Total	61

PQS, Seaport, Colombo

Designation	No Existing
Deputy Director(Research)	01
Assistant Director of Agriculture (Development).	04
Agriculture Monitoring Officer	05
Program Assistant (Agriculture)	02
Research Assistant (Supra grade)	01
Agriculture Instructor	14
Research Assistant	05
Management Assistant	01
Office Employee	01
Laborer (Permanent)	01
Laborer (Contract)	02
Total	37

PQS, Gannoruwa

Designation	No. Existing
Officer In-Charge/ Assistant Director of Agriculture (Research)	01
Research Assistant	01
Laborer (Contract)	02
Total	04

PQS, Mattala/ Hambantota

Designation	No. Existing
Officer In-Charge/ Assistant Director of Agriculture (Research)	01
Assistant Director of Agriculture (Development).	01
Agriculture Instructor	02
Technological Assistant	01
Driver	01
Laborer (Contract)	02
Total	08

2.2 SEED & PLANTING MATERIAL DEVELOPMENT CENTRE (SPMDC) - PERADENIYA

Seeds and planting materials play a major role in determination of quality, quantity and the cost of production of any agricultural produce. High quality seeds and planting materials pave the way to benefit in all these aspects.

The main responsibility of Seed & Planting Material Development Centre is to produce basic seeds and certified planting materials of all locally recommended crop varieties using the breeder stocks developed by research institutes of the Department of Agriculture. Production and supply of a considerable proportion of the national need of certified seeds of Other Field Crops (OFCs), Vegetables, Potato and fruit crops is another responsibility of the SPMDC. In addition, a buffer stock of certified seed paddy is also maintained.

The SPMDC has 27 seed farms under its purview to produce above basic seeds and certified planting material. However, certified seeds of rice, other field crops and standard seeds of vegetable crops are produced through contract growers by 14 regional Deputy Director of Agriculture (Seed) units stationed in different parts of the country. The SPMDC, at present, operates its functions through the above regional centers under the guidance of

the Director (Seed and Planting Material Development), Additional Director (Seed Paddy and OFC), Additional Director (Vegetables and Planting Material), Additional Director (Potato), Headquarter Deputy Directors and Assistant Directors.

The Mission of the SPMDC is to assure the supply of quality seed and planting material at competitive prices to the farming community in Sri Lanka.

Production of basic seeds and certified planting materials in Government Farms, supply of basic seeds to seed producers, multiplication of certified seeds through contract growers, supply of certified seeds for commercial cultivators, management of Government Farms, seed enterprise development and co-ordination, maintenance of buffer stocks of seed, co-ordination of seed and planting material supply are the major activities of the SPMDC.

In order to carry out all these activities, the SPMDC maintains 77 units namely 16 DDA (Seeds) Offices, 27 Seed Farms, 3 Special Units (Vegetable Seed Centre, Bean Seed Centre and Seed Potato Stores) and 30 Sales Centers scattered all over the country.

BUDGET

Table 2.2.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	25,354,617	23,540,194	93
Capital	51,669,635	51,158,678	99

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Projects			
• Accelerated seed farm development program	120,000,000	119,208,608	99
• Seed production & purchasing program	498,020,000	494,183,131	99
• Seed & planting material development program	100,000,000	99,916,010	100
• Promotion of local seed Potato production	60,000,000	59,336,318	99
Total	855,044,252	847,342,939	99

PROGRESS

Production & Supply of Seed Paddy

Basic Seed Paddy Production

Basic seed paddy (seed paddy of Foundation and Registered classes) of 33 varieties were produced in Government Seed Farms. Foundation seed paddy is produced using breeder seeds supplied by Rice Research and Development Institute Bathalagoda and its sub stations. Registered Seed Paddy (RSP) is produced from Foundation Seed Paddy (FSP). Certified Seed Paddy (CSP) which is used for the production of consumption paddy is produced from Registered Seed Paddy.

In a normal Yala season, the cultivated extent of paddy is about 500,000 ha and in a normal Maha season, it is about 780,000 ha. Therefore, about 1,280,000 ha of paddy is cultivated annually.

For the cultivation of this extent, the annual CSP requirement is about 6,400,000 bushels (bu) and for the production of this amount of CSP, 160,000 bu of RSP is required.

The total annual farm production of RSP in Government Seed Farms was 111,107 bu, viz. production volume of 67,145 bu RSP in the Maha 2016/17 and 43,962 bu in the Yala 2017. In addition, 5,992 bu of RSP was produced through contract seed production program. Therefore, total RSP production in the year 2017 was 117,049 bu. Therefore, Department of Agriculture has produced more than 71% of the total national RSP requirement which is well over the widely accepted healthy supply of 25% of the total national RSP requirement. The Table 2.2.2 shows the basic seed paddy production in ten Government Seed Farms in 2017.

Table 2.2.2: Basic seed paddy production in government seed farms during 2017

Farm	2016/17 Maha			2017 Yala			Total			Grand Total
	FSP	RSP	CSP	FSP	RSP	CSP	FSP	RSP	CSP	
Kanthale	569	9,401	0	876	8,932	0	1,445	18,333	0	19,778
Malwahtha	383	8,323	0	458	2,532	23	841	10,855	23	11,719
Polonnaruwa	1,496	17,532	259	684	6,720	166	2,180	24,252	425	26,857
Ambalanthota	474	3,120	1,042	265	1,766	147	739	4,886	1,189	6,814
Karadiyanaru	307	4,583	1,531	142	3,729	654	449	8,312	2,185	10,946

Farm	2016/17 Maha			2017 Yala			Total			Grand Total
	FSP	RSP	CSP	FSP	RSP	CSP	FSP	RSP	CSP	
Murunkan	0	5,437	394	0	0	0	0	5,437	394	5,831
Bataatha	175	1,618	327	168	1,165	83	343	2,783	410	3,536
Aluththarama	494	6,506	552	400	7,912	520	894	14,418	1,072	16,384
Mahailuppallama	765	6,654	268	298	8,957	1,429	1,063	15,611	1,697	18,371
Paranthan	179	3,861	521	69	2,249	1,135	248	6,110	1,656	8,014
Inginimitiya	0	110	184	0	0	0	0	110	184	294
Total (Bu)	4,842	67,145	5,078	3,360	43,962	4,157	8,202	111,107	9,235	128,544

Certified Seed Paddy Production

Certified Seed Paddy requirement for the country is produced mainly by private farmers and other private organizations by using the RSP produced by the SPMDC.

The SPMDC purchases 60,000 bu of CSP through contract seed production program annually spending about Rs. 90 mn. to keep as a buffer stock. In the year 2017, 48,501 bu of CSP has been purchased by this program.

In addition, to supply for emergency situations occurred in 2017, (For flood affected areas in Southern Province and drought affected areas in North Central and North Western Provinces) 90,192 bu of commercial and germination tested seed paddy was purchased. Table 2.2.3 shows purchasing of Registered, Certified, Commercial (Com) and Germination Tested (GT) tested Seed Paddy by regional DDA (Seeds) Offices during 2017

Table 2.2.3: Purchasing of Registered, Certified, Commercial and Germination tested seed paddy during 2017 by DDA (Seeds) Offices

DDA Region	2016/17 Maha				2017 Yala				Total				Grand Total
	RSP	CSP	Com	GT	RSP	CSP	Com	GT	RSP	CSP	Com	GT	
Aluththarama	595	35,51.5	157	0	0	1,959	0	21,307	595	5,510.5	157	21,307	27569.5
Pelwehera	0	1925	0	0	0	154	100	860	0	2079	100	860	3039
Polonnaruwa	0	2,216	0	255	0	3,099	648	18,966	0	5,315	648	19,221	25,184
Mahailuppallama	0	595	1,286	0	0	486	7,140	16,525	0	1,081	8,426	16,525	26,032
Ampara	0	3,953	8,468	0	0	3,534	0	7,453	0	7,487	8,468	7,453	23,408
Kanthale	0	1,971	1,579	0	0	415	853	904	0	2,386	2,432	904	5,722
Killinochchi	0	4,790	890	0	0	308	240	0	0	5,098	1,130	0	6,228
Bataatha	0	4,107	0	0	0	4,006	0	0	0	8,113	0	0	8,113
Karadiyanaru	0	0	0	0	0	594	0	0	0	594	0	0	594
Nikaweratiya	764	7,093	313	0	285	1,380	1,174	784	1,049	8,473	1,487	784	11,793
Thelijjawila	2,927	0	0	0	1421	380	0	0	4,348	380	0	0	4,728
Vavuniya	0	1,646	290	0	0	339	0	0	0	1,985	290	0	2,275
Total (Bu)	4,286	31,847.5	2,983	255	1,706	16,654	10,155	66,799	5,992	48,501.5	23,138	67,054	144,685

Table 2.2.4: Summary of seed paddy production in 2017 by the SPMDC

Program	FSP	RSP	CSP	Com	GT	Total
Farm program	8,202	111,107	9,235	0	0	128,544
Contract program	0	5,992	48,501.5	0	0	54,493.5
Emergency seed paddy purchasing	0	0	0	23,138	67,054	90,192
Total	8,202	117,099	577,36.5	23,138	67,054	2,732,29.5

Issue of Seed Paddy

Estimated 95,583 and 152,587 bu of seed paddy has been issued during the Yala 2017 and the Maha 2017/18, respectively.

Therefore, during the year 2017, in total 248,169 bu. of seed paddy has been issued by the Department of Agriculture (Table 2.2.5).

Table 2.2.5: Issue of seed paddy during 2017

Seed Class	2017 Yala	2017/18 Maha	Total
Foundation	406	1,171	1,577
Registered	48,525	60,908	109,433
Certified	44,451	34,170	78,621
Commercial	1,787	9,865	11,652
GT	414	46,473	46,887
Total (bu)	95,582	152,587	248,169

Production & Supply of Seeds of Other Field Crops

Other Field Crop (OFC) seed production of the SPMDC for 2017 has been planned and implemented by considering the seed demand for Food Production National Program 2016 - 2018. The SPMDC targets to produce and supply all necessary seeds of basic seed classes of Foundation and Registered. In overall, the SPMDC targets to accommodate around 25 percent of the national certified seed requirement excluding Maize and Groundnut. Maize is mainly cultivated using imported hybrid seeds and the demand for Maize seeds of open pollinated varieties (OPV) in Sri Lanka is less than 5% of the total requirement. Therefore,

the SPMDC has targeted to supply this amount of OPV Maize seeds. Due to less multiplication rate (1:10), high seed rate (100 kg/ha) and bulkiness, targeted production of certified Groundnut seeds is 15 percent.

Thirty six varieties belong to ten Other Field Crops were multiplied and produced under four different classes of seeds namely, Foundation, Registered, Certified and Commercial by using breeder seeds supplied by the Field Crop Research and Development Institute and its sub stations,. However, due to high demand for certified or commercial seeds and as a result of shortage of supply, Germination Tested (GT) seeds were also purchased and supplied in order to supply comparatively better seeds from available alternatives. Even though it has been named

“Germination Tested”, all possible important quality parameters are tested in qualifying for purchasing.

Basic (Foundation & Registered) OFC Seed Production in 2017

Foundation seed production is done only in Government Seed Farms, while registered seed production is done in both Government Seed Farms and through the contract seed production system.

In the year 2017, 22,309 kg of foundation seeds, and 164,357 kg of registered seeds were produced through both systems. In comparison to the last year’s production, both foundation

and registered OFC seed production is almost similar to that of 2016.

OFC Seed production in Government Seed Farms

Only OFC seeds of Foundation and Registered classes are produced at Government Seed Farms. Seeds of other lower classes are also received as a result of down grading of the seeds of targeted classes. Table 2.2.6 shows the contribution of each Farm for basic OFC seed production and Table 2.2.7 shows variety and class-wise production of OFC seeds by the Farms.

Table 2.2.6: Basic seed production (Foundation & Registered) of OFC in government seed farms during 2017 (kg)

Farm	Black gram	Green gram	Cowpea	Groundnut	Maize	Maize Hy	Sesame	Finger millet	Chili (OPV)	Chili Hy	Soy bean	Big Onion Seeds	Total
Mahailuppallama	211.5	482.3	731	0	3,341.53	1,171	126	841.1	34.5	68.4	2,063.5	73.9	9,144.73
Bata atha	991	630	3,204	742	9,407	1,477	464	6,441	58.7	0	2,338	18.1	25,770.8
Aluththarama	0	1,036	1,331	0	3,182.4	0	186	0	105.9	0	0	0	5,841.3
Polonnaruwa	163	644	351.5	0	548.8	0	49	2,229	39	0	985	15.2	5,024.5
Kundasale	0	0	0	0	0	0	0	0	14.5	0	0	22.8	37.3
Paranthan	0	0	0	0	0	0	0	360	0	0	0	0	360
Murunkan	430	0	532	2,120	190	0	0	0	0	0	0	0	3272
Pelwehera	0	0	29.5	80	0	0	0	0	0	19.2	0	0	128.7
Middeniya	0	208	630	12	0	0	849.5	103	0	0	0	16.4	1,818.9
Malwaththa	0	0	1,393	1,220	0	0	30.3	426	35	0	0	0	3,104.3
Kanthale	0	0	0	0	0	0	0	0	0	0	0	0	
Inginimitiya	0	0	0	0	0	0	0	0	0	0	0	0	
Eluwankulama	0	0	0	893	0	0	116.5	0	0	0	0	0	1,009.5
Karadiyanaru	91.5	115	279	1,120	1,080	13	0	0	22	0	0	0	2,720.5
Total	1,887	3,115.3	8,481	6,187	17,749.7	2,661	1,821.3	10,400.1	309.6	87.6	5,386.5	146.4	58,232.53
Seeds produced in other classes	0	0	490	202	9,231	0	15	27	0	0	0	0	11,791
Grand total	1,887	3,115.3	8,971	6,389	26,980.7	2,661	1,836.3	10,427.1	309.6	87.6	5,386.5	146.4	70,023.53

Table 2.2.7: Basic seed production of OFC in government seed farms during 2017 (kg) (Variety and class wise production)

Crop	Variety	Maha 2016/17				Yala 2017				Year Total
		Found	Reg	Cert	Com	Found	Reg	Cert	Com	
Black gram	MI 1	346.5	1,205.5	0	0	205	0	0	0	1,757
	Anuradha	0	0	0	0	0	130	0	0	130
Green gram	MI 5	208	115	0	0	271	0	0	0	594
	MI 6	445	550.8	0	0	1,416	109.5	0	0	2,521.3
Cowpea	Bombay	0	279	0	0	29.5	0	0	0	308.5
	Waruni	456	2,773.5	0	0	1,260	1,267	0	0	5,756
	Dhawala	0	286	0	0	553.5	98.5	0	0	938
	ANKCP 1	344	0	0	0	5.5	0	0	0	349.5
	MICP 1	106	547	0	490	0	476	0	0	1,619
Soya	PB 1	953	2,002	0	0	523.5	587	0	0	4,065.5
	MISB 1	0	1,321	0	0	0	0	0	0	1,321
Maize	Ruwan	0	0	0	0	0	652.4	0	0	652.4
	Bhadra	1,588	13,471.7	0	9,231	1,355	682	0	0	26,327.9
	MIHY 1	0	1,477	1,081.4	0	103	0	0	0	2,661.43
Groundnut	Thissa	3,799	188.5	0	0	1,280	0	0	202	5,469.5
	Indi	0	86	0	0	0	0	0	0	86
	Anguna Jumbo	0	0	0	0	742	0	0	0	742
	ANKG 1	12	80	0	0	0	0	0	0	92
Sesame	Uma	249	1,114.3	86	0	0	332	0	15	1,796.3
	Malee	29.5	0	0	0	10.5	0	0	0	40
Finger millet	Ravi	0	618.6	0	27	0	0	360	0	1,005.6
	Rawana	0	1,715	0	0	529	0	0	0	2,244
	Oshada	1,549	4,679	0	0	268	681.5	0	0	7,177.5
Chilli seeds	MI 2	35	0	0	0	22	0	0	0	57
	KA 2	144.9	0	0	0	14.5	0	0	0	159.4
	MICH 3	49	0	0	0	44.2	0	0	0	93.2
	MICH HY 1	0	0	68.4	0	0	0	19.2	0	87.6
Sunhemp		0	0	0	132	0	0	0	1,694	1,826
Big onion bulbs	MIBO 1	96.7	0	0	0	0	0	0	0	96.7
	Dambulla Red	49.7	0	0	0	0	0	0	0	49.7
Total		10,460	32,509.9	1,235.8	9,880	8,632	5,016	379.2	1,911	70,024.03

Found – Foundation **Reg** – Registered **Cert** – Certified **Com** - Commercial

Contract Seed Production of Other Field Crops

A part of the registered seed requirement and all certified seeds are produced through contract seed production system. A small amount of commercial seeds are also received

as a result of down grading of seed lots in the process of production of higher classes of seeds.

OFC seed production under contract system is shown in the Table 2.2.8 and 2.2.9.

Table 2.2.8: Amount of OFC seeds produced through contract seed production system and purchased as germination tested seeds by Regional DDA (Seeds) Offices in 2017 (kg) – DDA region wise

DDAs Office	Amount of seeds purchased (kg)										Total
	Black gram	Green gram	Cowpea	Ground nut	Maize	Sesame	Finger millets	Chili	Soy bean	Big onion	
Mahalluppallama	10,100.9	159	946.5	606	0	4,798	0	28.75	214,484.5	0	231,123.7
Pelwehera	10,811	10,705	8,675	9,673.5	2,123.8	1,263.5	7,316.05	1,493	33,415	0	85,475.9
Aluththarama	6,440.5	78,111	12,171	22,938.5	6,482	245	3,810.5	0	0	0	130,198.5
Nikaweratiya	80,406	39,292.5	3,534.5	70,331	22,315.3	4,857	50	216	0	0	221,002.3
Bata-atha	0	86,658	709.5	3,526	0	1,000	0	0	0	49	91,942.5
Vavuniya	34,846	0	576	39,865	3,319.9	0	0	130.5	0	0	78,737.4
Ampara	0	589	7,887.5	3,100.5	4,928.35	0	0	0	0	0	16,505.4
Kilinochchi	2,343	0	253	17,165	385	0	2,488	0	0	0	22,634.0
Polonnaruwa	14,327	430.5	0	4,404	0	0	0	0	0	0	19,161.5
Karadiyanaru	0	0	598.5	26,700	0	0	0	0	0	0	27,298.5
Kanthale	112	0	0	45	0	0	0	0	0	0	157.0
Total	159,386.4	215,945	35,351.5	198,354.5	39,554.35	12,163.5	13,664.55	1,868.25	247,899.5	49	924,236.55

Table 2.2.9: OFC seed purchasing through contract seed production system and as germination tested (GT) seeds by Regional DDA (Seeds) Offices in 2017 (kg) - Class wise

Crop	Variety	Maha 2016/17				Yala 2017				Total	
		Foundation	Registered	Certified	Commercial	GT	Registered	Certified	Commercial		GT
Black gram	MI 1	0	14,004	15,009.5	15,983.5	44,131	1,424.5	31,273	6,058.7	20,402	148,285.7
	Anuradha	0	2,429	634.5	1,636.5	0	3,052.5	2,601.5	746.7	0	11,100.7
Green gram	MI 5	0	0	0	0	0	1,357	0	0	0	1,357
	MI 6	0	2,149.5	12,796.5	552.5	756	31,731.5	83,314.5	11,002.5	72,285	214,588
Cowpea	Bombay	0	43	70	58	0	0	0	0	0	171
	Waruni	0	494	1,409.5	0	0	4,425.5	12,316	488.5	0	19,133.5
	Dhawala	0	808	2,607.5	56	287	782	7,306	1,154	0	13,000.5
	ANKCP 1	0	385	324.5	0	0	0	0	0	0	709.5
	MICP 1	0	0	87	0	0	0	1,778	472	0	2,337
Soya	PB 1	0	8,495	137,775	7,355.5	0	9,760	84,514	0	0	247,899.5
Maize	Ruwan	0	1,037.4	0	0	0	0	0	0	0	1,037.4
	Bhadra	0	12,471.9	11,579.75	0	0	463.4	2,513.7	0	0	27,028.75
	MIHY 1	3,319.9	385	0	0	0	0	7,783.3	0	0	11,488.2
Groundnut	Thissa	0	10,454	82,534.5	5,380.5	21,938	15,237	31,013	22,664.5	7,962	197,183.5
	Indi	0	384.5	0	0	0	0	432	0	0	816.5
	Tikiri	0	354.5	0	0	0	0	0	0	0	354.5
Sesame	Uma	0	78	1,253.5	0	409	2,359	2,194.5	4,816.5	1,053	12,163.5
Finger millet	Ravi	0	50	0	0	0	0	0	0	0	50
	Rawana	0	0	0	0	0	1,768	720	0	0	2,488
	Oshada	0	0	2,137.5	0	0	1,925	6,929	135	0	11,126.5
Chilli seeds	MI 2	0	0	0	0	0	0	593.028	0	0	593.028
	KA 2	0	0	0	130.5	0	0	216	0	0	346.5
	Galkiriyagama	0	0	0	0	0	0	520.579	0	0	520.5786
	MICH 3	0	0	28.755	0	0	0	379.446	0	0	408.201
Big Onion Bulbs	Dambulla Selection	0	0	0	49	0	0	0	0	0	49
Total		3,319.9	54,022.8	268,248	31,202	67,521	74,285.4	276,398	47,538.4	101,702	924,236.56

Table 2.2.10: Total OFC seed production during 2017

Crop	Variety	Foundation	Registered	Certified	Commercial	GT	Total
Black gram	MI 1	551.5	16,634	46,282.5	22,042.2	64,532.5	150,042.7
	Anuradha	0	5,611.5	3236	2,383.2	0	11,230.7
Green gram	MI 5	479	1,472	0	0	0	1,951
	MI 6	1,861	34,541.3	96,111	11,555	73,041	217,109.3
Cowpea	Bombay	29.5	322	70	58	0	479.5
	Waruni	1,715.5	8,960	13,725.5	488.5	0	24,889.5
	Dhawala	553.5	1,974.5	9,913.5	1,210	287	13,938.5
	ANKCP 1	349.5	385	324.5	0	0	1,059
	MICP 1	106	1,023	1,865	962	0	3,956
Soya	PB 1	1,476.5	20,844	222,289	7,355.5	0	251,965
	MISB 1	0	1,321	0	0	0	1,321
Maize	Ruwan	0	1,689.8	0	0	0	1,689.8
	Bhadra	2,943.2	27,089	14,093.45	9,231	0	53,356.65
	MIHY 1	0	0	14,149.63	0	0	14,149.63
Groundnut	Thissa	5,079	25,879.5	113,547.5	28,247	29,900	202,653
	Indi	0	470.5	432	0	0	902.5
	Tikiri	0	354.5	0	0	0	354.5
	Anguna Jumbo	742	0	0	0	0	742
	ANKG 1	12	80	0	0	0	92
Sesame	Uma	249	3,883.3	3,534	4,831.5	1,462	13,959.8
	Malee	40	0	0	0	0	40
Finger millet	Ravi	0	668.6	360	27	0	1,055.6
	Rawana	529	3,483	720	0	0	4,732
	Oshada	1,817	7,285.5	9,066.5	135	0	18,304
Chilli seeds	MI 2	57	0	593.028	0	0	650.028
	KA 2	159.4	0	216	130.5	0	505.9
	Galkiriyagama	0	0	520.5786	0	0	520.5786
	MICH 3	93.2	0	408.201	0	0	501.401
	MICH HY 1	0	0	87.6	0	0	87.6
Big Onion True Seeds	MIBO 1	96.7	0	0	0	0	96.7
	Dambulla Selection	49.7	0	0	49	0	98.7
Sunhemp		0	0	0	1826	0	1826
Total		22,309.1	164,357	547,840.6	90,531.4	169,222.5	994,260.6

Table 2.2.11: Achievement of targets of OFC seed production in 2017

Crop	Annual National seed requirement for 2017 (according to NFFP 16-18) (kg)	Targeted Percentage supply from SPMDC	Produced amount of seeds in 2017 (kg)	Produced amount as a percentage of national seed requirement
Black gram	356,480	25	161,273	45
Finger millet	61,745	25	24,091	39
Green gram	691,478	25	219,060	32
Soy bean	1,074,575	25	253,286	25
Chili	18,081	25	2,265	13
Cowpea	399,960	25	44,322	12
Groundnut	1,869,300	15	204,744	11
Sesame	211,640	25	13,999	07
Maize	2,226,148	05	69,196	03

Seed production targets of Black gram, Finger millet, Green gram and Soybean, have been achieved over 100 percent while Chilli, Cowpea, Maize and Groundnut seed production target reached over 50 percent. However, Maize seed production of open pollinated varieties was limited due to difficulties of finding required isolation distances among scattered hybrid Maize cultivations. Sesame seed cultivations were badly affected by unfavorable weather conditions and resulted in low yields (~25% of production target).

Hybrid OFC seed production has been increased; for the first time, 87 kg of Chili hybrid seeds have been produced. 14,149 kg of maize hybrid seeds have been produced in this year which is much higher than the production in 2016 (i.e. 1,962 kg).

As far as the overall OFC Seed production is concerned, the total OFC seed production in 2017 (994,260 kg) is only slightly less than

that of the year 2016 (1,117,999 kg), even though there were continuous droughts and untimely rains. It is also a notable achievement that the share of Germination Tested (GT) seeds in 2017 (169,222 kg) is far less than that of the year 2016 (507,037 kg).

Issues of OFC seeds during the year 2017

Issues of OFC seeds for Yala 2017 and Maha 2017/18 are shown in table 2.2.11. For Yala 2017, 490 mt of OFC seeds have been issued while 336 mt of OFC seeds have been issued for Maha 2017/18. Therefore, during the year 2017, 826 mt of OFC seeds have been issued. This is a significant achievement compared to that in the OFC seeds issued in the year 2016 (i.e. 683 mt).

Table 2.2.12: Issuing of OFC seeds during the year 2017 (kg)

Crop	Yala 2017						Maha 2017/18						Year 2017					
	Found.	Reg.	Cert.	Com.	GT	Total	Found.	Reg.	Cert.	Com.	GT	Total	Found.	Reg.	Cert.	Com.	GT	Total
Black gram	914	3,503	8,998	8,728.92	6,301.5	28,445	421	9,349	11,294	2,517	30,430	54,011	1,335	12,852	20,292	11,246	36,732	82,456
Green gram	687.5	1,883	40,797	16,513	7,285.3	67,166	535.1	5,477	23,403	6,357	10,440	46,212	1,223	7,360	64,200	22,870	17,725	113,378
Cowpea	415	5,489	8,570	535	394.75	15,404	755.5	12,810	10,578	2,339	0	26,482	1,171	18,299	19,149	2,873	395	41,887
Soya	798	10,636	48,948	38,929	157,841	257,151	50	5,835	21,004	3,320	13,230	43,439	848	16,471	69,952	42,249	171,071	300,590
Maize (OPV)	413	3,086	2,494.75	0	0	5,993	285.7	10,050	9,968	370	0	20,674	699	13,136	12,463	370	0	26,667
Maize Hybrid	387	986	3,843.5	1,860.45	0	7,077	2	510.75	11,184	551.25	0	12,248	389	1,497	15,027	2,412	0	19,325
Groundnut	3,716	17,425	49,493	8,456	15,448	94,537	1,712	13,227	50,568	34,422	19,730	119,659	5,428	30,652	100,061	42,878	35,178	214,197
Sesame	282.1	909.95	1,428	202.75	5,176	7,999	56.05	408.4	1,082.4	980	25	2,551	338	1,318	2,510	1,182	5,201	10,550
Finger millet	134.8	1,328.3	3,298.92	202.75	0	4,965	54	7,532	2,909	0	0	10,495	189	8,860	6,208	203	0	15,460
Chilli seeds	123.84	52.75	554	0	0	731	23.875	167.32	710.53	60.46	0	962	148	220	1,265	60	0	1,693
Sunhemp	0	0	0	582	0	582	0	0	0	172	0	172	0	0	0	754	0	754
Big onion bulbs	0	0	5	2	0	7	0	0	0	0	0	0	0	0	5	2	0	7
Total	7,870	45,298	168,431	76,012	192,447	490,058	3,895	65,367	142,701	51,088	73,855	336,906	11,765	110,665	311,132	127,100	266,301	826,963

Production & Supply of Vegetable

Seeds

There are 67 DOA recommended vegetable varieties including 10 hybrid varieties of 19 vegetable crops grown in the country.

Basic seed production

Production of Basic seeds of some varieties was carried out in 8 Government Seed Farms (Table 2.2.13). Total Basic seed quantity produced in 2017 is almost double of that of the year 2016 (1,961 kg).

Table 2.2.13: Vegetable basic seed production in Government Farms - 2017

Crop	Quantity Produced (kg)		
	2016/17 Maha	2017 Yala	Total
Amaranthus	331.4	299.9	631.3
Bean	1,279.3	237.3	1,516.6
Bitter gourd	3.4	20.1	23.5
Brinjal	37.4	0	37.4
Bushitavo	129.4	159.7	289.1
Cucumber	8.3	0	8.3
Luffa	2.7	0	2.7
Mae	253.5	0	253.5
Okra	0	720.0	720.0
Pumpkin	0	28.0	28.0
Snake gourd	70.3	212.3	282.6
Sweet melon	99.2	0	99.2
Thibbattu	210.7	0	210.7
Tomato	32.7	2.6	35.3
Total	2,458.3	1,679.9	4,138.2

Standard Vegetable Seed Production

Both public and the private sector organizations were involved in the production of standard seeds. Only standards seeds are produced through contract growing system under the SPMDC. The quantities of standard vegetable seeds produced by the SPMDC in 14 Government Seed Farms and under the contract growing system in 5 seed production regions (Aluththarama, Kundasale,

Nikaweratiya, Mahailuppallama and Vavunia) are indicated in Table 2.2.14. The total production in the year 2017 is almost the same as that of the previous year (10,653.5 kg). The production was restricted in taking into consideration of the availability of additional seed stocks of some crops, the average demand and supply and the seed deterioration losses by aging.

Table 2.2.14: Standard vegetable seed production (kg) by SPMDC - 2017

Crop	Farm Program			Contract Program			Grand Total
	2016/17	2017	Total	2016/17	2017	Total	
	Maha	Yala		Maha	Yala		
Amarunthus	0	178.2	178.2	0	0	0	178.2
Bean	249.9	302.2	552.1	3,010.5	0	3,010.5	3,562.6
Bitter gourd	230.5	0	230.5	14.7	26.47	41.17	271.67
Brinjal	164	51.2	215.2	2.5	0	2.5	217.7
Bushitawo	20	0	20	0	0	0	20
Capsicum	246.5	358.15	604.65	2	0	2	606.65
Cucumber	0	0	0	31.7	72	103.7	103.7
Pumpkin	89.4	0.6	90	0	0	0	90
Luffa	0	39.3	39.3	73	0	73	112.3
Mae	548.6	146.4	695	0	187.6	187.6	882.6
Okra	978.3	113	1091.3	85.8	197.2	283	1,374.3
Snake gourd	0	763.8	763.8	71.5	78	149.5	913.3
Spinach	101.8	0	101.8	431.7	0	431.7	533.5
Tomato	20.4	60.7	81.1	0	2.3	2.3	83.4
Winged bean	117.5	139.6	257.1	209.1	0	209.1	466.2
Sweet melon	45	171.4	216.4	0	0	0	216.4
Chilli - Werania	63.5	22.2	85.7	0	0	0	85.7
Total	2,875.4	2,346.75	5,222.15	3,932.5	563.57	4,496.07	9,718.22

Hybrid Vegetable Seed Production

F₁ hybrid seeds of Tomato, Bitter gourd & Cucumber varieties were produced in

Aluttarama, Kundasale, Mahailuppallama, Polonnaruwa and Ambepussa Seed Farms. (Table 2.2.15).

Table 2.2.15: Hybrid vegetable seed production in govt. farms (kg) – 2017

Crop	2016/17 Maha	2017 Yala	Total
Tomato	7.0	0	7.0
Bitter gourd	0	41.6	41.6
Cucumber	65.595	28.4	93.995
Total	72.595	70.0	142.595

Following issues were negatively affected to achieve the production targets of vegetable seed production in year 2017:

- Even though, there were 10 vegetable hybrids varieties released by the DOA,

production of some hybrid varieties was limited due to some problems of parental lines such as “OK H 1” of Okra, ‘Bathiya’ of Tomato and ‘Prarthana’ of Capsicum.

- Production of standard seeds of ‘Thilina’ variety of Tomato and ‘Krishna’ variety of

Winged bean were not done in 2017 due to the genetic instability (i.e. low purity) of basic seeds.

- Vegetable seed cultivations in Government Seed Farms and contract growing system were badly affected by unfavorable weather conditions (continuous droughts and unexpected rains) resulting in low yields. Some cultivations were given up due to severe drought which has caused not only water shortage but also high pest and disease incidence as well as loss of pollen viability by high temperature.
- Some allocated lands for vegetable seed production in Government Seed Farms were not utilized due to water shortage resulted by continuous drought situation.
- On the other hand, low seed purchasing prices in comparison to high production cost, most of seed producers in contract growing system were given up producing vegetable seeds to the DOA.

Supply of Vegetable seeds during 2017

Vegetable seeds were distributed through the SPMDC sales outlets (33 Nos.) and registered dealer network. These dealers include Agrarian Service Centres (ASCS), Cooperative societies, Farmer Organizations, Provincial DOA and private registered seed merchants. Dealer network is strengthened in year 2017 through reactivating the members and appointing new dealers island wide. Total No. of active seed dealers under the SPMDC was about 300 in 2017. Quantities of vegetable seeds supplied by the SPMDC are given in Table 2.2.16.

Table 2.2.16: Vegetable seed supplied by DOA – 2017(kg)

Crop	Issues for 2017 Yala						Issues for 2017/18 Maha						Grand Total
	Breeder	Basic	Standard	Comercial	Hybrid	Total	Breeder	Basic	Standard	Comercial	Hybrid	Total	
Bean	65.7	30	2432.259	0	0	2527.959	100	633.15	3913.75	0	0	4646.9	7174.859
Bitter gourd	3.82	39.3	548.534	18.59	0	610.244	242.425	47.605	517.25	0	12.93	820.21	1430.454
Brinjal	6.875	30.8	64.435	0	9	111.11	0.36	55.385	216.69	0	11.525	283.96	395.07
Bushitavo	10	59.9	303.65	0	0	373.55	30	40.505	2249.873	0	0	2320.378	2693.928
Capsicum	0	4.3	223.65	0	0	227.95	0.1	2.7	290.85	0	0	293.65	521.6
Carrot	0	0	0	0	0	0	0	3.7	0	0	0	3.7	3.7
Cucumber	1.075	3.65	307.364	0	0.1	312.189	3.69	5.25	729.45	0	0.1	738.49	1050.679
Luffa	0	7.05	261.05	0	0	268.1	0	20.3	281.54	0	0	301.84	569.94
Mae	4	181	460.7	0	0	645.7	26.8	149.7	3195.355	0	0	3371.855	4017.555
Okra	5.625	59.05	498.885	0	0	563.56	10.2	86.9	1740.33	0	0	1837.43	2400.99
Pumpkin	0	2	38.93	0	0	40.93	0	1.3	84	0	0	85.3	126.23
Thibbatu	0	0.09	0	0	0	0.09	0	0.09	0	0	0	0.09	0.18
Radish	0	0.5	200.71	0	0	201.21	0	41.65	933.9	0	0	975.55	1176.76
Snakegourd	4.73	91.65	557.65	0	0	654.03	1.85	127.75	526.15	0	0	655.75	1309.78
Spinach	0	1	31.9	0	0	32.9	0.2	2.1	532.825	0	0	535.125	568.025
Sweet Melon	0	1.75	4	00	0	5.75	0.25	0	73.3	0	0	73.55	79.3
Tomato	0.43	3.495	53.58	0	1.31	58.815	0.54	2.325	109.83	46.2	1.27	160.165	218.98
Winged bean	24.75	0	381.6	28.5	0	434.85	0	46.4	474.8	1743.17	0	2264.368	2699.218
Amaranthus	0.6	3.4	82.2	0	0	86.2	0	207.6	27	0	0	234.6	320.8
Total	127.605	518.94	6451.097	47.09	10.41	7155.137	416.415	1474.41	15896.893	1789.37	25.825	19602.911	26758.048

Supply of home gardening vegetable seed packs for “Ekwemu Nagitimu. Atu Kotu Purawamu” program in 2017

Under Food Production National Program for 2016-2018 of the Ministry of Agriculture through the Department of Agrarian Development, the SPMDC was able to supply 577,197 home garden vegetable seed packs consisting of vegetable seeds of 6 crops. In addition, 56,946 small packs (10 grams) consisting of a mixture of Chilli, Capsicum, Tomato and Brinjal seeds were distributed for raising nursery seedlings under the above program.

Production & Issues of Seed Potato in year 2017

The Seed Potato production program of SPMDC is carried out only in the Government Seed Farms situated in Nuwara Eliya District.

Pre-basic (G₀) mini tuber production in the year 2017 was 1,060,744 tubers which is slightly higher than that of 2016. Productivity could not be increased during the year 2017, due to transition process of poly tunnel activities from Geoponic to Aeroponic system.

Total production of basic and certified seeds was 653.31 mt. which is also slightly higher than that of 2016. The drought prevailed during year 2017 affected Potato cultivations limiting the achievement targets.

Due to the development activities implemented through development funds, the DOA has been able to supply potato seeds to the farmers at a highly concessionary price, compared to imported seed potato.

The production of G₁ mini tubers has been started in the newly constructed poly-tunnel complex at Seetha Eliya Farm. Therefore, continuous increase of seed production can be expected from 2019 onwards.

Table 2.2.17: Production of Pre-basic (Go) mini tubers, Basic (G₁, G₂ & G₃) and Certified (C₁ & C₂) seed potato during year 2017 (Variety Granola)

Season	Pre Basic (Number of G ₀ mini tubers)	Basic (mt.)	Certified (mt.)	Total (mt.)
2016/17 Maha	1,060,744	8.565	104.031	112.596
2017 Yala		228.253	312.461	540.714
Total	1,060,744	236.818	416.492	653.31

Table 2.2.18: Seed Potato supplied by DOA during year 2017

Variety	2017 Yala	2017/18 Maha	Total
Granola (Basic & Certified)	123.807 mt	524.923 mt	648.73 mt
Granola (mini tubers)	591,790 Nos.	629,346 Nos.	1,221,136 Nos.

Production & Supply of Planting Material in the Year 2017

Planting material production program was implemented in 22 DOA Farms and 5

Research Farms under the farm advance account. The planting material production includes budded plants, rooted cuttings, seedlings, suckers of fruit crops and a few of others.

Total planting material production was 1,141,776 which is slightly lower than that of the year 2016. The reason for this is the drought experienced during the latter parts of 2016 and 2017 resulting shortage of supply of materials for scions and seeds for root stocks.

Other than that, certain plant nurseries were affected by drought by hindering the supply of irrigation water. In spite of this situation, the issues of planting material have been increased in 2017, compared to the year 2016.

Table 2.2.19: Production and Supply of planting material in DOA Farms in 2017

Crop	Production	Issues
Budded Plants		
Avocado	8,578	9,302
Beli fruit	21,372	22,082
Durian	17,241	14,303
Wood Apple	22,903	12,301
Jak	35,132	21,721
Guava	1,398	655
Uguressa	7,145	5,363
Lime	13,556	6,696
Mango	219,395	150,035
Mandarin	21,986	17,827
Jambu	2,705	2,395
Orange	26,658	27,002
Rambutan	53,389	49,819
Sapodilla	2,975	2,503
Star fruit	12,131	10,983
Pears	5,003	3,958
Apple	49	53
Weralu	2,446	2,453
Anoda	10,383	12,201
Mangosteen	1,967	1,650
Garcinia	7,150	6,583
Super Grade plants	8,599	6,184
Other	6,336	5,748
Sub Total	508,497	391,817
Rooted Cuttings		
Grapes	1,550	1,243
Jambu	12,612	11,823

Crop	Production	Issues
Pomegranate	134	131
Lemon	7,851	6,533
Passion Fruit	1,302	1,643
Dragon fruit	1,376	984
Sesbania	7,184	4,375
Super Grade Plants	110	115
Other (Pepper, Betel etc.)	1,449	2,459
Sub Total	41,800	36,192
Seedlings		
Amberella	11,153	10,830
Star fruit	5,411	1,634
Papaya	39,817	63,542
Pomegranate	87,643	78,489
Beli	1,853	377
Guava	95,741	87,127
Sesbania	4,415	3,811
Weralu	2,833	695
Uguressa	1,150	458
Durian	5,363	148
Dwarf Drumstick	9,252	7,960
Lime	111,951	67,602
Orange	6,577	79
Mangosteen	5,258	2,587
Nelli	9,575	4,878
Anoda	88,234	30,932
Passion Fruit	17,807	36,471
Cashew	1,250	947
Super Grade Plants	716	601
Other (Tamarind, Arica nut, Teak, Mahogany, Neem, Coconut etc.)	17,208	13,621
Sub Total	523,207	412,789
Suckers		
Banana	12,604	17,583
Pine apple	52,782	67,032
Other	2,886	2,550
Total	68,272	87,165
Grand Total	1,141,776	927,963
Vegetable Pots (Chilli, Capsicum, Tomato, Brinjal)	28,059	33,261

Performance of the Farm Advance Accounts in 2017

Table 2.2.20: Farm Advance Account – 2017

No.	Farm	Work-in Progress (Rs.)	Net Profit/ Loss (Rs.)
1	Aluttarama	10,504,580.66	3,385,437.76
2	Ambalantota	178,172.66	-1,793,154.87
3	Ambepussa	3,212,039.09	-1,940,682.49
4	Bataata	-6,727,152.94	-11,183,349.77
5	Bandaragama	452,537.76	-300,289.59
6	Kandapola	11,070,934.36	6,593,487.71
7	Kantale	23,378,123.24	20,725,345.68
8	Kundasale	3,882,458.90	692,950.23
9	Karadiyanaru	5,462,982.02	1,539,339.43
10	Mahailuppallama	6,399,976.90	94,546.38
11	Malwatta	4,014,091.14	-290,041.14
12	Meepilimana	3,812,435.88	1,773,303.86
13	Middeniya	-5,216,385.41	-8,196,786.25
14	Murunkan	4,834,729.42	1,348,831.92
15	Piduruthalagala	7,906,691.04	5,443,367.22
16	Polonnaruwa	35,538,369.54	26,183,256.32
17	Paranthan	5,648,971.81	2,838,443.61
18	Pelwehera	3,622,766.07	3,762,590.98
19	Rahangala	1,654,934.83	-2,582,934.44
20	Sita Eliya	9,918,909.27	9,006,994.04
21	Telijjawila	-595,689.44	-1,347,864.85
22	Udaradella	10,067,619.89	6,469,772.00
23	Ulpothagama	-919,757.84	-2,346,526.26
24	Walpita	2,198,183.78	-575,120.53
25	Weerapana	-2,876,780.31	-4,693,128.40
26	Other Units	155,059,186.85	136,300,999.15
Total		292,482,929.18	190,908,787.70
As per Consolidated Account		295,431,250.254	190,908,787.70

PLAN FOR 2018

- Improvement of lift & main irrigation system in Ambepussa, Kundasale, Eluwankulama, Middeniya and Bata atha farms. (Allocation - 35.0 Mn.)
- Implementing of automated seed processing system with pre cleaners, dryers. (Allocation - 18.0 mn.)
- Construction of new stores in Bata atha, Eluwankulama and Aluttarama farms. (Allocation - 33.0 mn.)

STAFF LIST

Designation	No. Existing
Director	01
Additional Director of Agriculture	02
Deputy Director of Agriculture	19
Assistant Director of Agriculture (Development)	11
Administrative Officer	02
Agriculture Monitoring Officer	03
Program Assistant (Agriculture)	03
Agriculture Monitoring Officer	03
Program Assistant (Agriculture)	03
Development Officer	47
Agriculture Instructor	136
Farm Machinery Instructor	01
Public Management Assistant	60
Technological Assistant	110
Farm Clerk	26
Driver	68
Tractor Operator	34
Storeman	22
Plant Yard Attendant	02
Machinist	06
Carpenter	02
Mason	01

Designation	No. Existing
Electrician	01
Technician	02
Mechanic	04
Budder	36
Circuit Bungalow Keeper	06
Lorry Cleaner	06
Office Employee	07
Watcher	154
Laborer (Permanent)	1,332
Sanitary Laborer	24
Laborer (Contract)	464
Total	2,592

2.3 SOCIO ECONOMICS AND PLANNING CENTRE (SEPC) – PERADENIYA

The SEPC functions as the major advisory body, supporting the DOA and the Ministry of Agriculture, in formulating agricultural policies, research and development planning and conducting socio-economic research and agricultural policy analysis. In addition, Agriculture statistics are compiled through a statistical unit. The Centre also coordinates the activities of local and foreign funded project proposals of the DOA. In year 2017, socio-economic research and policy analysis were focused on economic and financial viability, social acceptability of agriculture development programs and investment in agriculture and

input policies. The Centre contributed to solve problems concerning food shortage, especially in the context of recent changes in government policies and changes in global and domestic economic environment by providing information to policy makers in developing strategies. The comprehensive program to build a database on cost and returns of all major food crops on district and seasonal basis was continued. Further the SEPC was involved in socio economics research under 7 research streams and database management works during the year.

BUDGET

Table 2.3.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	5,526,000	5,301,146	96
Capital	3,727,095	3,194,263	86
Total	9,253,095	8,495,409	92

PROGRESS

Cost and returns of crop production

The costs and return studies, Yala 2016, Maha 2016/17, and Yala 2017 for paddy, subsidiary food crops, root and tuber crops and vegetables were published. The data include total costs of production, average yields, farm gate prices, gross and net returns, and unit costs of production. The data are useful for making decisions on crop production and marketing at the farm level as well as in policy making at national level. Collected data for Maha 2016/17

were analyzed and being processed for publication. The primary data collection for Yala 2017 was completed.

AgStat 2017

The book on agricultural statistics comprising salient information on food crop sector was compiled and to be published in January 2018. AgStat 2017- Vol. XIV contained numerous information such as socio economic data, land use types, extent and production, import and export, per capita availability, wholesale and retail prices. The statistical information

provided in this book is widely used by number of stake holders who are interested in agriculture.

Research highlights

Sustainability of rice based agriculture sector in Sri Lanka through SRP standards

Rice is the widely grown food crop of Sri Lanka as it is the staple food of the people with annual per capita consumption of 110 kg. Even though Sri Lanka place in a minute position in the global rice sector it is of paramount importance to achieve global sustainable standards by Sri Lankan rice sector. Hence this study was executed to evaluate Sri Lankan rice farmers according to the standards of Sustainable Rice Platform (SRP) which enables to identify the level of sustainability. A survey was conducted in 2016 Yala season to collect data using twenty randomly selected farmers from Polonnaruwa and Rajanganaya areas. Standard data collection tool was used for data collection, data aggregation and analysis. Already assembled data on 2015/16 Maha season were also used for the study. According to the estimates average SRP score is 59.9 which is slightly below the essential performance level while the highest is 73 and the lowest is 48. The range of missed threshold value is 6-14. Among the eight main goals, farm management obtained lowest average score whereas labour conditions gained highest average score.

Study of adoptability of recommended Groundnut varieties and factors associated

This study was conducted in major Groundnut cultivated districts such as Monaragala, Mullaitivu, Kurunegala and Puttlam. Data analysis and report writing were completed and it was revealed that adoption rate of recommended Groundnut varieties was 37% while vast majority of the surveyed farmers were aware only variety 'Tissa'. Timely availability of quality seeds, association with extension service, and access to credit was highly associated with adoption of recommended varieties.

Study of Factors affecting Sesame cultivation in the Hambantota district

The study found that cultivated extent and production of sesame in the Hambantota district have shown decreasing trend in contrast to the increasing trend in all island sesame production. Lack of lands, government regulation on land use, unfavorable rainfall pattern and wild animal in the area were the major barriers which affected Sesame production in the District.

Chemical usage pattern and challenges in practicing IPM (Integrated Pest Management) package in vegetable cultivation in the Hambantota district

This study was aimed to find chemical usage pattern in low country vegetable cultivation in the Hambantota district and factors that affecting implementation of IPM package in the area. The study was a good combination of literature review on the subject and survey research conducted in the area through a

questionnaire administration. Data collection was done and data analysis is currently on going.

Evaluation of women engagement in “Hela Bojunhala” Production (Bataatha) on improving livelihood outcome

This study is based on the survey research to inquire present status of the ‘Hela Bojunhala’ program and scrutinize improvement of household livelihood outcome through the program. Currently survey research through a well-structured questionnaire is ongoing and data analysis is ongoing.

Market level lapses of quality of vegetable seeds in Sri Lanka

Seed quality is a prerequisite for good crop production. Basic seed is the starting material for standard seed which is commercially available class produced under the quality control of Seed Certification Service (SCS). Having both fully or partially certified seeds and uncertified seeds in the market highlights the need of quality assurance of the seeds available in the market. In such a situation, even though both Private and Government sectors are accountable to supply quality seeds of local varieties to farmers, there is no assurance of the quality of the seeds available at the markets. Given the situation, to address the lapse of quality of vegetable seeds available in the markets this study was conducted. The survey was done based on Multistage stratified random sampling technique and it covered ten vegetable crops in four Districts. The total samples size was 350. A full laboratory test was done and found 86% of seed samples were above 75% laboratory germination. Only 72% of the seed samples were within the moisture range which

seeds must possess. Regression analysis followed by sensitivity analysis revealed that 1% decrease of the inverse of moisture (increase of moisture percentage) will reduce the laboratory germination by 1-2.3. The study concludes that there is a quality problem in vegetable seeds at the market.

Development of seed pricing formula for paddy seeds of Seed & Planting Material Development Centre

Department of Agriculture has a significant contribution in seed industry of Sri Lanka. Since there was no specific pricing policy for pricing the produced seeds, this study aims to develop a pricing formula for paddy. Economic pricing model was used for pricing. Indirect fixed cost was apportioned based on the cultivable extent of the farm. Pricing formula was developed for seed paddy and tested for Seed & Planting Material Development Centre farms to identify the optimal price.

Economic evaluation of traditional and DOA developed new improved paddy varieties

According to central bank report 2015, paddy contributes 1.9% to GDP. According to Census data, Sri Lanka became self sufficient in rice in 1995. At present we are having self sufficiency ratio of 150% according to the Department of Census. At present we are in a debate of moving back to traditional varieties in order to move in to organic agriculture. This study focuses on economic impacts of such a move. The analysis comprised of a cost comparison of traditional varieties vs DOA varieties. Moreover, impact on food availability, self sufficiency ratio and effects to balance of payment by the cultivations were also

examined. Results of the study shows that moving back into traditional varieties is moving backwards of the economy.

South-East Asian Ricardian studies: Bangladesh, Sri Lanka, Thailand, and Vietnam

Bangladesh, Sri Lanka, Thailand, and Vietnam each conducted a Ricardian analysis of crop net revenue (NR) in their country. The countries defined seasons slightly differently depending on their monsoon and dry periods. They also sometimes included slightly different variables in their regressions. Temperature in the dry season is significant only in Sri Lanka and Vietnam. Temperature during the monsoon season is significant in Sri Lanka, Thailand and Vietnam. The temperature coefficients in Bangladesh are not significant. Precipitation in the dry season is significant in Sri Lanka and Thailand. Precipitation in the wet season is significant in Bangladesh and Sri Lanka. Farm area is significant in Sri Lanka, Thailand and Vietnam. This study revealed that the net revenue received from farming system is negatively associated with the climate change and lead to significant damage even with adaptation.

Economics of mix vegetable cropping in Nuwara Eliya District

The study intends to identify socio economic factors in mix cropping farming community. It will be helpful in identifying the best crop selection on mix vegetable cropping system. Study is based on primary data. Analysis is ongoing.

Effects of climatic variation on rice production in Sri Lanka

Agricultural production is vulnerable to variation in climate which affects almost all the regions in the world. Using a pooled cross-sectional data from major rice producing regions in Sri Lanka, the responsiveness of rice production to average temperature and rainfall variation was analyzed. Output per farm is modeled as a quadratic function of temperature and rainfall (with other standard controls) using fixed effects equations. Monte Carlo simulations are used to model effect on rice yield under various climate change scenarios. Both average temperature and rainfall have concave, non-monotonic effects upon production, which implies that variations in growing climate are likely to have negative effects on rice production. It was found that modest increases in average temperature and variation in rainfall had only a small effect of ambiguous sign. Yet, increases in average temperature beyond 2 °C were likely to have strong negative effects on rice production. For example, 4 °C increases in average temperature individually or in combination with changing rainfall can lead to approximately 30% yield drop in rice production. As rice production is a key component in economic performance of Sri Lanka and other developing countries, climate change is likely to have serious economic implications and food security issues in the future.

Base-line survey on the project of “Post- harvest management and value addition of fruits in Sri Lanka” - (Funded by SAARC Development Fund)

SAARC Development Fund (SDF) has invested in post-harvest management and value addition

of fruit production in Sri Lanka. The project has given a sophisticated pack house and processing Centres with the equipment for competent entrepreneurs who are negotiating with considerable number of fruit farmers both in the same area and adjacent areas.

The general objective of the study was to determine the current status of the fruit farmers negotiating with the entrepreneur. The study involved primary data collection from the selected sample of farmers negotiating with the entrepreneurs in 7 locations where the structures established.

In Kandy, revealed that a less number of farmers follow the maturity indices at harvesting and not follow pre and post-harvest operations. The most significant finding in Matale is that 75% of the fruit farmers are used to cultivate TJC mango variety having minimal wastage and the profit is paramount. Majority of the farmers in Dambulla area cultivate mango (Variety TJC) and papaw (Variety Red lady). Among the banana varieties “Seeni” and “Embul” varieties comprised the majority and farmers obtained a higher price for these varieties comparatively. In Anuradhapura, papaw has the highest potential and farmers have received a good price. In this area 50% of famers used maturity indices. Mango has a significant postharvest loss which is around 25%.

Fruit village evaluation (National Food Production Program-2016-2018)

National Food Production Program (2016-2018) has commenced fruit village establishment project at each GN Division to enhance fruit production and availability in the country. During the year 2016, 1373 of fruit villages

were established representing eighteen types of fruits. At the first stage, the evaluation was carried out among 31 fruit villages. These fruit villages were located in thirteen Districts (Colombo, Kandy, Matale, Matara, Rathnapura, Hambanthota, Kalutara, Nuwara Eliya, Monaragla, Kegalle, Gampaha and Badulla) and represented twelve types of fruits i.e. Rambutan- 1, Anoda- 9, Papaw-1, Mangosteen- 3, Sweet orange- 6, Mango- 2, Passion fruit-1, Wood apple- 2, Mandarin- 1, Pineapple-2, Durian- 2 and Pears- 1. Study reveals that except Pineapple villages, out of total plants sample (18,987 plants) 70% were being alive during the visits. Further, it revealed that in total 16% plants of whole sample was dead before and after the planting. In case of Pineapple villages (Gampaha), it showed up more than 90% of the plants were grown in the field. Results express that more than 70% of the each sample of sweet orange, wood apple, mandarin and mango plants were survived. The average survival rate of Rambutan, Passion fruit and Anoda was calculated as 68%. In case of Durian and Mangosteen, it showed less than 50% alive plants rate which was relatively a low level respect to the others. The loss of fruit plants was mainly happened because of prevalence of prolonged drought condition, wild animal damage and improper field management practices. As per the results, it is needed to be considered the proper time period to distribute planting materials (rainy period) while introducing and training the beneficiaries regarding novel technologies and field management practices.

Seminars/ Workshops/ Training programs conducted by SEPC

Participation in various committees

- Director, SEPC continued to serve as a member of the National Committee on Socio Economics and Policy Analysis of the Sri Lanka Council for Agricultural Research Policy
- Additional Director continued to serve as the Chairman of the Price Committee of the DOA.
- Additional Director, served in the working group for Trade Facilitation of DOA for National Trade Facilitation Committee (NTFC).

Crop Forecast

Crop forecast is a monthly publication of SEPC which monitors the monthly cultivation progress of paddy, other field crops and vegetables. This report provides information related to prevailing situation on crop cultivation; forecast the production, regional distribution of production, harvesting periods, occurrence of extreme weather conditions, pests and diseases. This would guide various stakeholders towards major policy decisions at national level. Twelve crop forecast reports were prepared during the year covering latter 2016/17 Maha, 2017 Yala, and early 2017/18 Maha. Crop Forecast Unit in collaboration with National Agriculture Information and Communication Centre (NAICC) developed software named 'Crop Forecast Information System' raise efficiency data flow at field level to national level. All information needed on present situation of crops will be generated from the system. Crop Forecast Unit conducted

series of awareness workshops in collaboration with NAICC to Agriculture Instructors island-wide including Mahaweli.

Policy Guidance Provided

- Several situational and early warning reports containing policy guidance that helps to maintain domestic farm income and food security situation on major food crops were prepared by SEPC and presented the information at the meetings of Cost of Living Committee.

Coordination of Project Preparation and Submission

The National Food Production Plan (NFPP) implementation continued for year 2017. All projects belong to the food crop production and productivity improvement program and the majority of the projects which comes under each thrust area are continuing from year 2016 to year 2017. Accordingly, 12 proposals which fall to different thrust areas were collected, format checked, collated, compiled and submitted to the Ministry of Agriculture. The thrust areas were input management, natural resources management and adoption to climate change, youth and woman participation, knowledge management, food safety, consumer health and satisfaction and research and technology development. The projects were mainly focused on ensuring availability of quality seeds through joint programs to be implemented with state and private sector participation, conservation of agro-biodiversity, youth and women agri-entrepreneurship program, establish efficient service transfer through e-agriculture cum communication system and to have easy access to the people through multimedia approach and

minimization of the use of pesticides, reduction of the excessive use of chemical fertilizer and harmful substances in the food production and educating the people in the same.

Co-ordination of Programs/ Projects

SEPC continued coordination of NARP projects and memoranda of understanding on behalf of the DGA.

Working as National Focal Points

- Director, SEPC served as National focal point on Agriculture on Bay of Bengal Initiative for Multi Sectorial Trade and Economic Cooperation
- Director, SEPC served as National focal point on Center for Alleviation of Poverty and Sustainable Agriculture

PLAN FOR 2018

- Compilation of book which contains current agricultural information – Agstat XIV
- Development of ‘Crop Forecast Information System’
- Crop – Forecasting reports – 2017/18, Maha, 2018 Yala, 2018/19 Maha
- Cost of cultivation study- 2017 Yala, 2017/18 Maha, 2018 Yala

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	-
Additional Director	01	-
Deputy Director	02	-
Assistant Director of Agriculture	23	12
Administrative Officer	01	-
Economist Assistant	21	11

• Socio Economics Research

- **Production economics** - productivity and profitability analysis, economies of scale, production forecast
- **Agriculture marketing and price analysis** - Value chain analysis, marketing systems, price analysis, consumer behavior
- **Rural development** - Agricultural credit / micro finance, technology dissemination and adoption, Gender dimension, agricultural insurance
- **Agriculture policy analysis** - Input, Land, Price, Food, Research and Trade policy, competitiveness
- **Agriculture project analysis and planning** - Planning, Project coordination, preparation, appraisal and evaluation
- **International trade and international relations** - Studies on trade agreements, Global and regional trends, International collaboration and MOU
- **Environmental and resource economics** - studies on climate change and sustainable agriculture, Externalities

Designation	No. Approved	No. Existing
Statistical Assistant	02	-
Agriculture Monitoring Officer	05	-
Program Assistant (Agriculture)	11	-
Development Officer	08	12
Public Management Assistant	08	07
Technical Assistant	03	03
Driver	06	06
Office Employee	01	01
Laborer	04	03
Laborer (Contract)	02	01
Total	99	56

3.1 EXTENSION AND TRAINING CENTRE (ETC)- PERADENIYA

The Vision of the Extension and Training Centre is to achieve excellence in Agriculture through Agriculture Extension, Education and Training. Mission is to dedicate to a sustainable agricultural development by developing human resources through agricultural extension, training and education with the identification of appropriate technology required for mandatory crops which are coming under the scope of ensuring economic and social revival of farmer prominent clients.

Extension & Training Centre plays a vital role to achieve highest level of productivity in the food crops sector to ensure food security of the country as well as to improve living standards of the farming community. Achievements of the Centre are focused on four main areas: Extension, Training, Agricultural Education and Examination. Following activities are conducted to achieve the objectives of the Extension and Training Centre by the respective units.

- Conduct Paddy, Other Field Crops, fruits and vegetables development programs island wide
- Direct extension programs under major irrigation schemes conduct by the six Inter-Provincial Units
- Collaborative extension programs with Provincial and Mahaweli areas
- Conduct training programs for extension staff, farmers, entrepreneurs and others at three In-service Training Institutes, four District Agricultural Training Centers and Farm Mechanization Training Centre.
- Conduct “Higher National Diploma on Agriculture Production & Technology” course (NVQ Level6) at Schools of Agriculture Kundasale, Pelwehera, Angunakolapelessa, Vavuniya and Karapincha.
- Conduct “National Diploma on Agriculture Production & Technology” course (NVQ Level 5) at schools of Agriculture Wariyapola, Labuduwa, Bibile, Palamuna, Anuradhapura & Paranthan
- Conduct NVQ Level 3 - 4 agriculture courses at 2 schools of Agriculture (Labuduwa and Wariyapola), 2 In-service Training Institutes (Angunakolapelessa & Hansayapalama), 2 District Agriculture Training Centers (Weeravila & Polonnaruwa) and HTDI Bibile
- Conduct Young Farmers Club activities
- Conduct Bee development activities at Bindunuwewa Bee Development Unit.
- Conduct Agribusiness counseling, Good Agricultural Practices (GAP), Micro irrigation & Protected agriculture programs, Women’s agricultural extension programs, promote local food consumption among public by establishing “Hela bojun“ sales centers and maintaining them
- Horticultural crops development and Training activities at Bibile Horticultural Crops Training & Development Institute

- Conduct Agriculture Production & Technology course level 5 & 6 exams, efficiency bar exams and recruitment exams for junior category staff of DOA
- Promote organic fertilizer production and utilization at The Centre of Excellence for Organic Agriculture - Makandura

BUDGET

Table 3.1.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Capital	120,657,472	85,504,730	71
Recurrent	143,640,261	125,553,155	87
Projects			
<i>Funds under DOA Votes</i>			
• Land and land development	13,000,000	12,863,658	99
• Agricultural School development	55,000,000	47,196,676	86
<i>Funds under Ministry Votes</i>			
• Introduction of Locally Appropriate GAP program in Sri Lanka (AFACI GAP)	1,600,000	900,000	56
• Assessment of existing fertigation protocols with respect to their marketable yield in different districts	238,400	238,400	100
• Development of sustainable plant nutrient management package for vegetable cultivation	800,000	786,000	98
• 2017 Food Production National program (Rice)	13,390,000	13,057,000	98
• 2017 Food Production National program (Chilli)	16,320,000	14,379,100	88
• 2017 Food Production National program (Maize)	57,707,000	57,641,000	100
• 2017 Food Production National program (Soya)	79,320,000	77,107,500	97
• 2017 Food Production National program (Green Gram)	2,780,000	2,340,400	84
• Commercial farming and agribusiness development with youth attraction	5,800,000	4,270,000	74

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• 2017 Food Production National program :Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local and export markets through GAP	27,800,000	23,760,000	85
• 2017 Food Production National program (Change present food patterns through 'Hela bojun')	57,000,000	43,477,198	76
• Bee keeping development project	15,000,000	9,093,500	61
• Promotion of organic fertilizer production and utilization	15,500,000	11,992,000	77
• The Centre of Excellence for Organic Agriculture, Makandura	16,000,000	7,533,000	47
• Skill development program (FMTC)	59,086,200	51,156,905	87
Total	700,639,333	588,850,222	84

PROGRESS

SPECIAL PROJECTS

1. Agriculture School Development program

This project was implemented in 2013 with the aim of improving infrastructure facilities in 5 schools of Agriculture (NVQ level 6) situated at Kundasale, Angunakolapelessa, Pelwehera, Vavunia and Karapincha. Construction work of two storied academic building at SOA, Karapincha was completed during the year 2017. Construction work of three storied academic building and renovation of Wijerama hostel at SOA Kundasale were also completed. At SOA Vavuniya roof repairing of kitchen, dining hall, farm office and main store complex was completed during the year 2017. Laboratory facilities and hostel facilities were improved at School of Agriculture Pelwehera.

Construction of two storied building with a new Auditorium was started at School of Agriculture Angunakolapelessa in 2017 and will be continued in 2018.

2. Construction of Hostel for FMTC under Skill sector Development Program

This special project was implemented in 2015 with the aim of improving hostel facilities in Farm Mechanization Training Centre, Anuradhapura. Construction work of 7 hostel units which was started in 2015 was continued in 2016 and 2017. Total capacity of these 7 cabanas is 84 trainees and 12 trainees can be accommodated in one cabana. During the year under review construction work of 7 hostel units, landscaping activities around hostel units and essential extra renovations of buildings were completed.

3. National Food Production program - Paddy

Objective of the program is to motivate farmers to practice environmental friendly high yielding cultivation practices. To fulfill this task agricultural machineries were introduced for ploughing, seeding, transplanting and weeding of paddy cultivation. Introduction of these machineries will not only help to minimize environment pollution but will also help to solve the problem of labour scarcity for the cultivation practices of different stages. Under this project demonstrations were conducted to aware seedling broadcasting crop establishment method (Parachute method). Within Inter provincial and Provincial areas 33,700 and 67,940 parachute trays were distributed respectively to establish demonstrations. To increase the efficiency of urea application, 1,585 leaf colour charts were distributed among farmers. 323 training programs were conducted for farmers and officers to provide knowledge and skills regarding seedling broadcasting method, efficient fertilizer management by using leaf colour charts and organic fertilizer usage. Conducted 148 demonstrations to aware farmers about mechanical transplanting using fully automated transplanter. 20 trials were established to demonstrate the usage of liquid organic fertilizer by covering 20 ac of paddy lands in Anuradhapura Inter Provincial area. With the aim of uplifting seed paddy production which was decreased due to drought conditions, 3,582 bushels of seed paddy distributed. 55 farmers were registered as seed paddy producing farmers for 55 ac. Rice transplanters and Power weeders were purchased to provide Deputy Director

(Extension) offices and Agriculture schools. Two paddy laser levelers were given to Farm Mechanization Training Center and bund forming machine was given to Farm Mechanization Research center by this project.

4. National food production program - Chilli villages

Objectives of this project are to reduce the imports of dry Chilli, introduce new technologies and promote off season cultivation to increase year round Chilli production.

Supplying of irrigation kits and water pumps which started in 2016 with the intention of increasing water use efficiency was completed in 2017. Those ½ ac sprinkler irrigation kits and electric /fuel water pumps were given under 50% farmer contribution. 65 electric water pumps, 99 fuel water pumps and 69 sprinkler irrigation kits were provided to farmers. 337,950 polythene bags were provided with 50% farmer contribution. With the aim of increasing cultivation extent, 215 kg of seeds were distributed among farmers on free of charge. To establish commercial Chilli farms, 9,165 nursery trays were distributed. With the intention of promoting Chilli cultivation in new areas expenses of land preparation was paid to farmers. For 1 ha land preparation amount paid was Rs 10,000 and land preparation was completed in 424.75 ha. 337,950 number of polythene bags were provided to farmers with 50% farmer contribution. By this project training programs on nursery management, agronomic practices, micro irrigation, pest & disease management were conducted for farmers. Total number of training programs conducted were 147. During the year, 10 field days were completed and

established 14 demonstrations (plot size – 1/8 ac) on controlling leaf curl complex.

5. National food production program - Soya bean

Objective of the project is to popularize Soya cultivation and increase productivity to fulfil the national requirement. Construction of 5 agro wells which started in 2016 were completed in 2017. By this project, seeds were provided free of charge for 6,477 ha land extent. Provided inoculum free of charge for 1,760 ha cultivation. In new cultivation areas payments were done for land preparation. Amount paid for land preparation of 1 ha was Rs.4,000 and payments were carried out for land preparation activities completed in 500 ha. Basic seeds and registration fee were given for contract seed production which was carried out within the extent of 164 ha. To aware about the program 40 training classes were conducted to farmers. Provided 8 intercultiators, 4 seeders and 2 reapers for farmer organizations free of charge.

6. National food production program - Maize

Objective of the project is to reduce imports through increasing the cultivation extent and productivity of Maize. To establish the Maize crop in paddy lands during Yala season Maize seeds were provided under 50% farmer contribution for 314 ha. In Maha season demonstrations were established by providing local and imported hybrid seeds under 50% farmer contribution. Maize seeds were provided under 50% farmer contribution to establish cultivations in new areas during Maha with the aim of reducing the affect of drought conditions occurred during last Yala

season. Local hybrid (MI Maize Hybrid 01) seeds were provided free of charge to establish variatal demonstrations in 800 ha to popularize the variety. Agricultural machineries were provided free of charge to farmer organizations to promote mechnization with the aim of reducing cost of cultivation. 3 four Wheel tractor coupled seeders, 6 intercultiators, 2 threshers and 6 ridgers were povided to farmer organizations. Conducted 120 training programs to upgrade the knowledge of pre and post harvest technology. To popularize Popcorn cultivation, seeds were provided free of charge to establish demonstrations. Contract grower program was implemented at selected locations in Anuradhapura, Kurunegala, Moneragala and in 3 Army camps (Manic farm, Mac camp, Periyakattu and Wellikulam farms). The program was implemented in 12 ha land area and seeds, fertilizer and chemicals were provided free of charge to contract growers. Local Hybrid seeds produced by the contract and registered seed producers were purchased and amount of seeds purchased was 14,077 kg.

7. National food production program - Green gram

Main objetive of the project is to increase national Green gram production .With the implementation of this project it is expected to increase the income of green gram producing farmers, discourage over use of chemical fertilizers, encourage women to engage in productive agriculture, increase the value added production, minimize the post-harvest losses, increase storge facilities at farmer level and mechanization in Green gram cultivation. By this project registered seeds were given free of charge to produce certified seeds.

Registered seeds were supplied at the rate of 25 kg per ha and total land area used to produce certified seeds is 131 ha. Distributed 7,500 number of triple layer bags without charge among 2,300 beneficiaries as a new technology to store their seeds. Grain splitting machines were provided to 22 Green gram production societies to promote value added products. With the aim of mechanizing the cultivation, seeders were provided to 10 farmer societies. Seeds were supplied free of charge to establish 1 ac demonstrations by introducing technology package to increase the yield. This package consists of seed treatment, row seeding, IPM, processing and storage. Total number of demonstrations established were 57 covering 189.7 ha. 19 training programs were conducted to aware about technology package and proper storage. Media programs on implementing technology package also completed during the year.

8. Empowering women entrepreneurship through 'Hela Bojun' Sales centres

The Project was implemented with the objective of local food promotion and providing entrepreneurship for women. 3 'Hela bojun' sales centres at Padiyatalawa, Wakerei and Kantale which started in 2016 were completed during the year 2017. Construction work of Nittambuwa 'Hela Bojun' sales center was completed and opened. Construction work of Matara 'Hela Bojun' sales center was almost completed and sheduled to be opned in January 2018. Basic equipments and other necessities for above 'Hela bojun' sales centers were provided by the project. Construction work of Trincomalee and Chilaw 'Hela bojun' sales centers were

started. Renovation of already existing 'Hela bojun' sales centers at Galaha Junction, Gannoruwa and Kundasale was completed during the year 2017. Fifty seven training and awareness programs to develop entrepreneurship abilities were conducted for women in island wide.

9. Bee keeping development program

Increase pollination of the crops and fulfil bee honey requirement of the family through popularizing beekeeping at homegarden level is the main objective of this project. By implementing this project it is expected to organize small scale bee keepers and develop bee honey production as a profitable industry. By this project 107 bee keeping villages were established covering Inter provincial, Provincial and Mahaweli areas. A total of 2,140 number of beneficiaries comprising 20 from each village were selected and trained. A bee box, a smoker and a bee colony were given for each beneficiary. From the established bee keeping villages 100 village members were selected and trained as bee keeping technicians at Bindunuwewa Bee Development Unit. Conducted a training program regarding queen rearing for 10 selected village members and helped them to continue those activities within bee keeping villages. Training program was conducted for field officers who had been supervising the bee keeping villages. Steps were taken to upgrade training facilities at Bindumnuwewa and Wariyapola bee Development Units. Construction of two lecture halls were completed at two Bee Development Units during the year 2017. Bee keeping hand book which is useful for bee keepers and field

officers was also prepared and published by the project.

10. Agribusiness counselling program focusing certification of export agriculture food under Good Agriculture Practices (GAP) or Organic

By this project 146 number of SL - GAP certified commercial farms were formed. With the aim of formation and facilitation of GAP certified vegetable farms 48 sprinkler irrigation systems (½ ac), 500 plastic crates, 36 water pumps were provided with 50% farmer contribution. To form commercial Chilli farms under SL GAP, inputs such as insect proof nets, 30 sprinkler irrigation systems (1/2 ac 20 & 1/4 ac 10), 5 kg of Chilli seeds were given to farmers with 50% farmer contribution. 22 GAP model farms were established in DOA, PDOA and Mahaweli farms. Island wide awareness programs on GAP for farmers and general public were conducted. During the year under purview 750 awareness programs were completed and 9 bill boards were fixed. 520 training programs were completed. 222 banners, 20,000 commercial farm registration forms, internal audit check list and crop records were printed. One desk top computer, 25 laptops and one printer were purchased to facilitate central hub and regional stations of GAP implementation. GAP farmer data base was formed and 1900 number of GAP farm data were available. Established 2 sales outlets to sell GAP certified agri products for local consumers. 60 media programs were conducted. With the aim of implementation and monitoring the value chain actors for exports (improving and monitoring pack

houses) 1,095 pack house visits were completed.

11. Commercial farming and agribusiness development with youth attractions

Under this project 12 Agro entrepreneurs were benefited on (50% farmer contribution basis) various agri-based ventures such as rice and other grain processing, cultivation in protected houses, maintaining nurseries etc.. One training programme was conducted on farmer business school (FBS).

12. Promotion of organic fertilizer production and utilization

By this project development of organic packages for Pineapple, Guava and Passion fruit were carried out. For research work, construction of 1 protected house and 1 net house completed. 63 training programs were conducted for 7,193 trainees. 7 in situ farmer training at farmer fields were completed with the participation of 881 participants. To aware public, 6 workshops and 1 exhibition conducted. Established 5 ac organic orchard comprising Banana, Citrus, Jack, Guava, Passion fruit and Pineapple cultivation and 1 ac organic vegetable cultivation during the year. With the aim of producing compost, 2 ac gliricidia and wild sun flower cultivation was established. Glassware and chemicals needed for compost analysis were purchased to distribute within 8 regional testing centers. This project was implemented by the Centre of Excellence for Organic Agriculture at Makandura.

13. Introduction of Locally Appropriate GAP Programme in Sri Lanka (AFACI - GAP)

By this project awareness programs including 1 campaign and 4 training programs were conducted. To aware general public 30,000 copies of leaflets were prepared. 4 promotion programs were conducted for school children.

EXTENSION ACTIVITIES OF INTER-PROVINCIAL AREAS

Six Inter-Provincial (IP) areas located in the commanding areas of major irrigation schemes are under the purview of the Extension and Training Centre of the Central Department of Agriculture. Parts of the districts of Ampara, Anuradhapura, Hambanthota, Moneragala, Polonnaruwa and Kandy are demarcated as Inter-Provincial areas. Extension staff of the six inter provincial areas provide their services to farmers to enhance agricultural knowledge, improve skills and develop their attitudes towards increasing National Food Production and uplifting the living standards of farmer's by strengthening their income.

Total Paddy extents cultivated in IP areas during 2016/17 Maha and 2017 Yala were 145,898 ha and 85,611.5 ha respectively. The cultivated extents were decreased in both seasons due to scarcity of irrigation water in the tanks. Special attention was given to increase the cultivated extents of Other Field Crops during the year 2017. Mainly Maize, Green gram, Groundnut, Gingelly, Cowpea, Soy bean, Chilli, Finger millet, Black gram, Big onion and Red onion were cultivated in six Inter-Provincial areas.

Specific information and performances of each Inter-Provincial area are given below.

INTER-PROVINCIAL AREA - HAMBANTOTA

The Deputy Director of Agriculture (Inter-Provincial) office is covering the extension activities within the major irrigation areas in Hambantota and Rathnapura districts which include 06 AGA divisions (Ambalantota, Hambantota, Thissamaharama, Lunugamwehera, Sooriyawewa and Balangoda) and 08 Agrarian Service Centers (Ambalantota, Lunama, Badagiriya, Weerawila, Yodakandiya, Beralihela, Kaltota and Maurapura). Two segments namely Walawa and Kirindioya and Weerawila District Training Centre is functioning under Deputy Director of Agriculture (Inter-Provincial) office, Hambanthota.

Hambantota Inter Provincial Area covers the extent of 15,000 ha of paddy under major irrigation 1,100 ha under minor irrigation and about 50 ha under rain fed conditions. Uplands comes under Hambantota Inter provincial area is about 39,546 ha where mainly cultivate low country vegetables and fruits such as Banana and Papaya. Lunugamwehera, Liyangastotota (Ridiyagama reservoir) and Samanala wewa are the major irrigation schemes that provide irrigation facilities for cultivation activities. From those schemes main two seasons Yala, Maha and after Yala third season cultivation is practicing in most of the areas.

Main crop cultivating in this area is paddy and vegetable and fruit cultivation contribute a lot to district production and there is an increasing trend for Banana cultivation. In year 2017, Paddy productivity improvement program, Third season Green gram cultivation program, Green gram cultivation in Paddy lands due to drought, Fourth season Green gram cultivation

program, GAP program, OFC (Chilli, Maize, Groundnut, Finger millet) cultivation program, Home garden cultivation program, Vegetable cultivation program, Fruit village program, Honey bee production program, WFC program, Mango cultivation program in Mattala 100 ac, were implemented in the area by allocations provided by Ministry of Agriculture and DOA. These activities are conducting other than normal extension and production program in the district.

Progress

2016/17 Maha

Paddy

During 2016/17 Maha season targeted extent of paddy cultivation was 16,355 ha. It included 14,997 ha under major irrigation, 1,303 ha of minor irrigation and 55 ha of rain fed lands. Out of this target, cultivated extent under major and minor irrigation were 14,451 ha and 1,139 ha respectively. Extent cultivated under rainfed was 50 ha. Total cultivated extent was 15,640 ha under all three irrigation systems. The average paddy yield under major, minor and rainfed irrigation schemes were 7.2 mt/ha, 6.9 mt/ha and 6.7 mt/ha respectively. These average yields exceed the national average which is 4.2 mt/ha.

OFC

During 2016/17 Maha season targeted extents of OFC cultivation was 1,882.8 ha. It included 107 ha of Chilli, 95 ha of Maize, 101 ha of Groundnut, 300 ha of Finger millet, 29.7 ha of Cowpea, 14.2 ha of big onion, 13.9 ha of Red onion, 425 ha of Gingelly and 797 ha of Green gram. Achievements of the season were 132.85 ha of Chilli, 227 ha of Maize, 99 ha of

Groundnut, 228 ha of Finger millet, 43 ha of Cowpea, 6.6 ha of Big onion, 6,979 ha of Red onion, 85 ha of Gingelly and 648 ha of Green gram in the upland cultivation. Total cultivated extent was 1,477 ha.

Yala 2017

Paddy

Targeted extents of paddy under major, minor and rain-fed irrigation were 12,770 ha, 796 ha, and 105 ha respectively during the season. This brought the total targeted extent to 13,671 ha where the total cultivated extent of paddy during Yala 2017 was 12,403 ha. It included 11,727 ha under major irrigation, 666 ha under minor irrigation and 10 ha under rain fed conditions.

OFC

Total targeted extent of OFC during the season was 787 ha and it included 105 ha of Chilli, 130 ha of Maize, 130 ha of Groundnut, 268 ha of Finger millet, 12.4 ha of Cowpea, 90 ha of Gingelly and 53 ha of Green gram. Cultivated extents were 73.4 ha of Chilli, 77.5 ha of Maize, 35 ha of Groundnut, 11.5 ha of Finger millet, 5.6 ha of Soya, 20 ha of Cowpea, 20 ha of Gingelly and 24 ha of Green gram. This brings total OFC extent in to 267 ha.

Special projects

National Rice Production Program

By this project transplanting was carried out in 3.5 ac. 100 soil samples were tested. For certified seed paddy production 35.2 ha were cultivated and for self seed production 273 ha were cultivated. 31 training classes and 31 field days were conducted.

Organic manure promotional program

To promote organic fertilizer production and usage, 04 field days were conducted.

Chilli production program

Extent cultivated under this project was 114.5 ha and 10 kg of seeds were supplied to farmers.

One grinding mill and sealer was provided.

Green gram production program (Third season)

Cultivated extent was 3,010 ha and 13,000 kg of seeds were provided to farmers with 50% farmer contribution, 40 training programs were conducted to farmers. 1,000 triple layer bags were supplied for seed storage with 50% farmer contribution. Seed production program was implemented in 40 ha.

Maize production program

By this project 228.45 ha were cultivated. 1650 kg of quality seeds were supplied with 50% farmer contribution. 40 demonstrations were established and 20 training programs were conducted.

Mango cultivation program in Mattala 100 ac

Conducted 04 awareness and training programs.

INTER-PROVINCIAL AREA, KANDY

Deputy Director of Agriculture (Inter Province) Kandy area includes five Divisional Secretariat Divisions as Minipe, Wilgamuwa, Mahiyanganaya, Rideemaliyadda and Kandaketiya which belong to Kandy, Matale and Badulla Districts. Low lands of Minipe and Wilgamuwa Divisional secretariat areas are

irrigated by the Minipe anicut. In Mahiyanganaya Divisional Secretariat area, low lands are irrigated by Sorabora, Dambarawa and Mapakadawewa reservoirs. In Rideemaliyadda Divisional Secretariat low lands are irrigated by Nagadeepa reservoir. In Kandaketiya Divisional Secretariat low Land areas irrigated by Baduluoya and Bathmedilla anicuts. During Maha Season paddy is the main crop grown in low lands and other field crops are cultivated in uplands as well as in well irrigated low lands as small scale extents.

Progress

2016/17 Maha

Paddy

In 2016/17 Maha Season targeted Paddy cultivation area was 14,103 ha. This area consist of 12,108 ha under major irrigation, and 1995 ha under rain fed condition. During the season, cultivated paddy extent was 11,119 ha. It includes 9,964 ha under major irrigation and 1,155ha under rainfed. The progress was reduced due to low rain fall. Damage occurred to Minipe canal also affected to achieve the target. Paddy lands irrigated by Nagdeepa and Kandaketiya Irrigation systems not cultivated due to water scarcity. The average paddy yield under major and rainfed irrigation systems were 5.2 mt/ha and 4.5 mt/ha respectively.

Several farmers cultivated other field crops in well irrigated low lands in later part of the Maha season.

Other Field Crops

During 2016/17 Maha season targeted extents of OFC cultivation was 640 ha. It included 34 ha of Chilli, 420 ha of Maize, 15 ha of Groundnut, 62 ha of Finger millet, 11 ha of

Soya, 24 ha of Cowpea, 37 ha of Gingelly, 15 ha of Black gram and 24 ha of Green gram. Achievements of the season were 31 ha of Chilli, 488 ha of Maize, 13 ha of Groundnut, 108 ha of Finger millet, 8 ha of Soya, 25 ha of Cowpea, 23 ha of Gingelly, 5 ha of Black gram and 17 ha of Green gram in the upland cultivation. The total cultivated extent of OFC was 717 ha in the area.

Special Programs

- With the aim of producing seed paddy for 2017 Yala season, Emergency seed paddy production program was implemented in 181 ha extent with 143 farmers. Variety Bg 250 seed paddy were given free of charge to farmers who produce seed paddy for next Yala.
- Implemented Maize cultivation promotion program in new areas.
- Certified seed paddy production program was implemented in the extent of 200 ac and seed paddy was given for farmers with 50 % farmer contribution.
- Green gram seed production program conducted within 10 ha land area and seeds were provided free of charge to farmers.
- Yaya 02 program was implemented within the area to increase the productivity of paddy cultivation.

2017 Yala

Paddy

During 2017 Yala season paddy cultivation target was 7,932 ha and achievement was 9,025 ha. Cultivated extent was higher than the target due to adequate rain fall at the beginning

of the season. The average paddy yield of the season was 5.2 mt/ha.

OFC

During 2017 Yala season targeted extents of OFC cultivation was 3,641 ha. It included 29 ha of Chilli, 2,591 ha of Maize, 92 ha of Groundnut, 30 ha of Finger millet, 192 ha of Soya, 48 ha of Cowpea, 65 ha of Black gram and 514 ha of Green gram. Achievements of the season were 16 ha of Chilli, 1,597 ha of Maize, 28.5 ha of Groundnut, 31.4 ha of Finger millet, 162 ha of Soya, 49 ha of Cowpea, 22 ha of Black gram and 161.95 ha of Green gram in the upland cultivation. The total cultivated extent of OFC was 2,070 ha in the area. Cultivated extent of Green gram was very low compared to the target extent and main reason for this is low market price due to the reduction of tax for imported Green gram.

Special Programs

- Maize cultivation promotion program was implemented in the area and under this program seeds were provided to farmers with 50% farmer contribution.
- Soya cultivation promotion program was implemented. Soya seeds were given to farmers free of charge and cost of land preparation was paid to farmers.
- With the aim of increasing productivity of paddy cultivation Yaya 02 program was implemented in 38 yaya with the participation of 935 farmers. Total extent covered by the program was 838 ha.
- Certified seed paddy production program implemented in 65 ha with the participation of 126 farmers.

INTER-PROVINCIAL AREA, AMPARA

The Deputy Director of Agriculture (Inter-Provincial) office, Ampara consists of four agricultural administrative segments, viz. Uhana, Damana, Addalchchena and Sammanthurai. These four segments include 25 Agrarian Service Centres, 85 Agriculture Instructor ranges, 16 Divisional Secretariat divisions and 430 Grama Niladari divisions.

Main irrigated water source in Ampara district is Senanayake Samudraya at Iginiyagala. It has a capacity of 770,000 acre feet and provide water for 10 small tanks in Galoya left bank and right bank colonies. In addition to that there are 13 other small tanks which strongly support paddy cultivation in Ampara district. Main crop in the area is paddy and it provides 20% of national paddy production.

Progress

16/17 Maha

Paddy

During 2016/17 Maha season targeted extent of paddy cultivation was 73,534 ha which includes 57,549 ha of major irrigation, 4,414 ha minor irrigation and 11, 571 ha of rain fed lands. Out of this target, 53,400 ha and 4,410 ha cultivated under major and minor irrigation respectively. Under rainfed conditions 10,415ha were cultivated. This shows the total cultivated extent was 68,225 ha under all three irrigation systems. The average paddy yield under major, minor and rainfed irrigation schemes were 6.5 mt/ha, 4.5 mt/ha and 3.5 mt/ha respectively.

OFC

During 2016/17 Maha season targeted extents of OFC cultivation was 5,382 ha. It included 392 ha of Chilli, 3,847 ha of Maize, 780 ha of Groundnut, 171 ha of Cowpea and 192 ha of Green gram. Achievements of the OFC extents were 210 ha of Chilli, 3,655 ha of Maize, 479 ha of Groundnut, 112 ha of Cowpea and 107 ha of Green gram. This brought the total cultivated extent of OFC during the season to 4,563 ha. Reasons for not achieving the targets were water scarcity and unavailability of quality seeds.

Vegetables

In 2016/17 Maha season targeted vegetable land extent was 410 ha and it included 120 ha of Long bean, 125 ha of Okra, 100 ha of Luffa and 65 ha of Snake gourd. Cultivated total land extent was 233 ha and it consist of 71 ha of Okra, 62 ha of Long bean, 58 ha of Luffa and 42 ha of Snake gourd. Reason for not achieving the targets was water scarcity.

Fruit crop cultivation

In 2016/17 Maha, season target fruit extent was 78.5 ha including 50 ha of Papaw, 10 ha of Banana, 8.5 ha of Orange and 10 ha of Mango. However, cultivated total land extent was little higher (85 ha) than the target. The reason for exceeding the target was awareness programs which were conducted at the beginning of the season.

In addition to above activities following programs were conducted within the area.

- Establishment of new YFC
- Inspection of chemical shops in Ampara district
- Promotion of organic farming

Yala 2017

Paddy

Targeted extents of paddy under major and minor irrigation were 31,491 ha and 1,762 ha respectively. This brought the total targeted extent to 33,253 ha where the total cultivated extent of paddy during Yala 2017 was 36,653 ha. It included 34,690 ha under major irrigation schemes, 1,963 ha under minor irrigation. However from the cultivable paddy extent which was 61,963 ha only 59% was cultivated due to water scarcity.

OFC

Total targeted extent of OFC during the season was 884 ha and it included 188 ha of Chilli, 130 ha of Maize, 260 ha of Ground nut, 15 ha of Finger millet, 10 ha of Soya, 130 ha of Cowpea, 146 ha of Green gram and 5 ha of Black gram. Cultivated extents were 131 ha of Chilli, 82 ha of Maize, 260 ha of Groundnut, 3 ha of Finger millet, 124 ha of Soya, 312 ha of Cowpea, 146 ha of Green gram and 7 ha of Black gram. Total achievement of the OFC during the season was 1,065 ha. Promotion activities carried out by the National Food Production Program were helped to motivate farmers to increase the cultivated land extent of OFC.

Vegetable cultivation

In 2017 Yala season target vegetable land extent was 453 ha and it includes 110 ha of Brinjal, 90 ha of Long bean, 85 ha of Okra, 70 ha of Snake gourd, 60 ha of Bitter gourd, 40 ha of Luffa and etc. Cultivated total land extent was 453.38 ha and it consist of 99.35 ha of Brinjal, 84.25 ha of Okra, 66.02 ha of Long

bean, 49.55 ha of Bitter gourd and 44.03 ha of Snake gourd and etc.

Fruit crop cultivation

In 2017 Yala season cultivated fruit extent was 670 ha including 47.68 ha of Papaw, 166.83 ha of Banana, 301.795 ha of Mango, 108.11 ha of Orange, 19.39 ha of Water melon, 12.765 ha of Passion fruit and 13.52 ha of other fruit crops. By the fruit village development program 45 villages were established covering the extent of 133.8 ha with the participation of 531 farm families.

Highlights

- Establishment and development of OFC, vegetable and fruit cultivation farmer production societies.
- Inter season cultivation was carried out by covering 89.1 ha with the participation of 187 farmers.

INTER-PROVINCIAL AREA, MONARAGALA

Inter-Provincial area of Monaragala includes Siyambalanduwa, Okkampitiya, Ethimale and Thelulla Agrarian Service Centre divisions. Major irrigation systems of Monaragala Inter-Provincial area are Muthukandiya, Ethimale, Kotiyagala, Sadhathissa, Handapanagala tanks and Kumbukkan Oya Amuna. Paddy is the main crop grown and Maize is the second largest crop cultivated in the area. Extension staff of the Deputy Director of Agriculture (Inter provincial, Moneragala) office extends their service to nearly 20,000 farmers who live in 25 Grama Niladari Divisions of the area. They disseminate new technology regarding Paddy, OFC, vegetable and fruit production through conducting training, field

days and demonstrations. The extension staff give immense support to research activities by conducting large scale and small scale VAT and other demonstrations relevant to selected crops while popularizing use of machines in agriculture among rural farmers. Further they were able to mobilize farmers to engage in off farming livelihood like bee keeping, establishing YFCs, WFCs at the aim of empowering women and improving social capital of the farmers.

Progress

2016/17 Maha

Paddy

During 2016/17 Maha season targeted extent of paddy cultivation was 6,517 ha which included 2,633 ha of major irrigation, 1,180 ha minor irrigation and 2,704 ha of rain fed lands. Achieved extents were 1597 ha, 562 ha and 1,457 ha under major, minor and rainfed irrigation systems respectively during the season. The total cultivated extent was 3,617 ha under all three irrigation systems. This low achievement was due to lack of rainfall at the beginning of the season. The average paddy yield under major, minor and rainfed irrigation schemes were 5.4 mt/ha, 4.8 mt/ha and 3.2 mt/ha respectively.

OFC

During 2016/17 Maha season targeted extents of OFC cultivation was 6,292 ha. It included 58 ha of Chilli, 5,346 ha of Maize, 476 ha of Groundnut, 43 ha of Finger millet, 29 ha of Soya, 106 ha of Cowpea, 6 ha of Red onion, 23 ha of Gingelly, 155 ha of Black gram and 50 ha of Green gram. Achievements of the OFC extents were 42 ha of Chilli, 5,251 ha of

Maize, 381 ha of Groundnut, 44 ha of Finger millet, 16 ha of Soya, 80 ha of Cowpea, 33 ha of Red onion, 11 ha of Gingelly, 274 ha of Black gram and 13 ha of Green gram. This brought the total cultivated extent of OFC during the season to 6,145 ha. Reasons for not achieving the targets were water scarcity.

Vegetables/ Tuber crops

Cultivated extents and production of vegetables/tuber crops in Moneragala I/P area during 2016/17 Maha season is shown in Table 3.1.2.

3.1.2: Cultivated extents of Vegetables/Tuber crops in Moneragala IP area during 2016/17 Maha

Crop	Target (ha)	Progress (ha)
Pumpkin	55	50.5
Brinjal	26.2	22.8
Tomato	8.5	10
Okra	27.4	15.3
Cucumber	12.4	6.85
Bitter gourd	06	07
Ash plantain	12.4	4.3
Long bean	18	14
Luffa	0 6	04
Snake gourd	05	04
Manioc	12	6.8
Total	188.9	159.55

Fruits

Target extents and progress of fruit crops in Moneragala I/P area during 2016/17 Maha season is shown in Table 3.1.3.

3.1.3: Cultivated extents of Fruits in Monaragala IP area during 2016/17 Maha

Crop	Target (ha)	Progress (ha)
Banana	23.5	19.6
Orange	14.3	21
Papaw	21.6	15.2
Mango	59.5	33.85
Wood apple	55.5	31.15
Sweet melon	35.5	61
Total	209.9	181.8

2017 Yala

Paddy

During 2017 Yala season, targeted extent of paddy cultivation was 3,212 ha which included 2,155 ha under major irrigation and 1,057 ha under minor irrigation. Cultivated extents were 1,642 ha under major irrigation and 546 ha under minor irrigation. This shows the total cultivated extent was 2,188 ha under two irrigation systems. Production obtained from this extent was 11,487 mt. Average yield of paddy under major, minor and rainfed were 5.4 mt/ha, 4.8 mt/ha and 3.2 mt/ha respectively.

OFC

During 2017 Yala season targeted extents of OFC cultivation was 321 ha. It included 29 ha of Chilli, 15 ha of Maize, 104 ha of Groundnut, 72 ha of Soybean, 4 ha of Black gram, 89 ha of Cowpea, 8 ha of Finger millet. Achievements of the OFC extents were 14.9 ha of Chilli, 39.1 ha of Maize, 126.58 ha of Groundnut, 58.4 ha of Soya bean, 5.1 ha of Blackgram, 60.2 ha of Cowpea, and 2.8 ha of Finger millet. This brought the total cultivated extent of OFC during the season to 307.3 ha.

Vegetables/ Tuber crops

Cultivated extents and production of vegetables/tuber crops in Monaragala I/P area during 2017 Yala season is shown in Table 3.1.4.

3.1.4: Cultivated extents of Vegetables/ tuber crop in Monaragala IP area during 2017 Yala

Crop	Target (ha)	Progress (ha)
Pumpkin	24	30.3
Brinjal	27.3	11.5
Tomato	9.2	4.4
Okra	27	15.7
Cucumber	4.2	03
Bitter guard	6.2	2.5
Ash Plantain	04	05
Long bean	07	11.3
Luffa	6.2	1.3
Capsicum	11.4	4.5
Snake gourd	4.6	2.1
Total	131.1	91.6

Fruits

Targeted extents and progress of fruit crops in Monaragala I/P area during 2017 Yala season is shown in Table 3.1.5.

3.1.5: Cultivated extents of Fruits in Monaragala IP area during 2017 Yala

Crop	Target (ha)	Progress (ha)
Banana	35	25
Orange	16	22
Papaw	26	19
Mango	61	45
Wood apple	55.5	31.15
Sweet melon	35.5	61
Total	229	203.15

Special programs

- By the home gardening program 500 model home gardens were established and maintained.
- Under the bee keeping program 123 bee colonies were established and maintained.
- Training programs were conducted to farmers regarding different disciplines. To aware about mushroom production 6 training programs were conducted. 18 number of bee keeping training programs and 95 homegardening programs were conducted. To create awareness about Women Agriculture Extension program 85 training programs were conducted.

INTER-PROVINCIAL AREA, ANURADHAPURA

Anuradhapura Inter Provincial area covers twelve major irrigation schemes belong to Anuradhapura, Matale, Kurunegala & Puttlum Districts in Sri Lanka. The Deputy Director of Agriculture (Inter Provincial, Anuradhapura) office consists of three ADA segments and these segments include 43 AI ranges. To achieve national agricultural food production targets of paddy, OFC, fruits and vegetables, extension staff is dealing with many agricultural development programs. They are rendering services to more than 47,000 farm families of 29,000 ha of paddy lands & 25,000 ha of upland cultivations. Transferring new technologies, promotion of organic cultivation, introduction of farm mechanization, protected culture and micro irrigation techniques, supply of good quality planting materials, seeds of new varieties and other inputs, establishment of fruit villages, empowerment of farmer & farm women societies are some of the services

provided towards sustainable agricultural development in the area.

For the productivity improvement & for reducing cost of production in paddy, yaya program was launched while promoting parachute technique, paddy transplanting & weeding, use of good quality seed paddy, organic fertilizer application, integrated pest management, fertilizer application based on leaf colour chart and proper post harvest practices. Productivity improvement of other field crops were done through supplying good quality seeds, introducing seeders and intercultivators, establishing soil conservation bunds, providing micro irrigation techniques and protected houses.

At the end of each season, yield surveys are done to evaluate demonstrations. Permanent crop clinic program and IPM helped to minimize excess use of agrochemicals and thereby to promote farmers towards GAP.

Research staff were supported by extension staff by establishing, monitoring, evaluating & submitting reports on VAT.

30 Agriculture Instructors and 32 Technological Assistants carry out all field level agricultural extension activities related to all crops and they are responsible for collecting and submitting data.

Progress

2016/17 Maha

Paddy

During 2016/17 Maha season targeted extent of paddy cultivation was 32,055 ha which included 23,110 ha of major irrigation, 5,696 ha minor irrigation and 3,249 ha of rain fed lands. Cultivated extents were 10,315 ha,

1,446 ha and 1,113 ha under major, minor and rainfed irrigation conditions respectively. Total cultivated extent under all three irrigation systems were 12,874 ha. This low achievement was due to unfavourable rainfall at the beginning of the season. Production obtained from that extent was 69,450 mt. The average paddy yield under major, minor and rainfed irrigation schemes were 5.5 mt/ha, 5.1 mt/ha, 4.8 mt/ha.

OFC

During 2016/17 Maha season targeted extents of OFC cultivation was 10,043 ha. It included 676 ha of Chilli, 151 ha of Cowpea, 6,127 ha of Maize, 185 ha of Groundnut, 81 ha of Soybean, 200 ha of Green gram, 121 ha of Finger millet and 2,502 ha of Blackgram. Achievements of the OFC extents were 357 ha of Chilli, 312 ha of Cowpea, 6,415 ha of Maize, 165 ha of Groundnut, 212.3 ha of Soya bean, 94 ha of Green gram, 97 ha of Finger millet, 153 ha of Gingelly and 2,473 ha of Black gram. This brought the total cultivated extent of OFC during the season to 10,990 ha.

2017 Yala

Paddy

During 2017 Yala season targeted extent was 3,100 ha under major irrigation schemes. Extents were not targeted under minor and rainfed conditions. Cultivated extents were 6,067 ha, 275 ha and 0.5 ha under major, minor and rainfed irrigation conditions respectively. Total cultivated land area was 6,342.5 ha. Cultivated paddy extent was very low due to unfavourable rainfall at the beginning of the season. Average yields of

major, minor and rainfed conditions were 5.5 mt/ha, 5.1 mt/ha and 4.8 mt/ha respectively.

Other Field Crops

During 2017 Yala season targeted extents of OFC cultivation was 1,836.5 ha. It included 124 ha of Chilli, 132 ha of Maize, 51.4 ha of Groundnut, 587.4 ha of Soybean, 181 ha of Green gram, 26.6 ha of Black gram, 34 ha of Cowpea 7.50 ha of Finger millet, 496.5 ha of Gingelly and 195.6 ha Big onion. Achievements of the OFC extents were 76.9 ha of Chilli, 184.7 ha of Maize, 65 ha of Groundnut, 337.1 ha of Soybean, 7.85 ha of Finger millet 28.57 ha of Cowpea, 38.3 ha of Green gram, 11.45 ha of Black gram, 516 ha of Gingelly and 85.8 ha Big onion. This brought the total cultivated extent of OFC during the season to 1,351.67 ha.

Fruits and vegetables

Pumpkin and Eggplant cultivations were prominent in the area. Cultivated extents of Pumpkin and Eggplant were 622 ha and 320 ha respectively. Among 1672 ha of existing extent of Papaya, Banana, Mango and Orange cultivations, 789 plants were rehabilitated. Established new cultivation extent was 580 ha.

Special programs

- Seed paddy production program was implemented in 341 ha and produced 500 bushels of seed paddy. Emergency seed paddy purchasing program was carried out and supplied 20,063 bushels of seed paddy.
- Self seed paddy production promotion program implemented and 1200 farmers participated they were able to fulfil their seed paddy requirement for next season.

- Yaya program was implemented in 80 yaya covering the extent of 900 ha .
- 5,000 leaf colour charts were distributed among farmers to minimize the misuse of nitrogen fertilizer.
- Bag planting of chilli was promoted under homegarden level and more than 23,500 of bag cultivation was able to fulfill family requirement plus additional income. In order to minimize the effect of chilli leaf curl complex, 38 IPM demonstrations were established, 96 training classes were conducted and 1479 farmers were benefited.
- To prevent soil erosion in Maize cultivation areas in upland, 104 soil conservation bund demonstrations were established and to reduce cost of cultivation, 44 mechanization demonstrations were conducted .
- 67 inspections of pesticide shops were completed and 23 permits were issued in this year. All other registered shop owners were informed on rules and regulations of pesticide act.
- Participation of 268 farmers in 119 permanent crop clinics and engaging 45 farmers in 45 IPM demonstrations helped to minimize usage of agrochemicals.
- Conducted 386 training classes on home gardening and 2184 number of farmers participated. 416 model home gardens were established in 36 villages where farm families fulfilled their vegetable requirement and thereby saved money as well as had safe foods.
- 615 members of 25 new farm women societies were benefited by 79 indigenous

food promoting programmes & kitchen development programs.

INTER-PROVINCIAL AREA, POLONNARUWA

Polonnaruwa district land extent is 333,000 ha and it is divided as 196,000 ha for DOA (Inter Provincial) and 137,800 ha for Mahaveli Authority. There are five divisional secretariats offices in the IP area such as Madirigiriya, Hingurakgoda, Lankapura, Thamankaduwa and Elahara. The major irrigation schemes are Parakrama Samudra, Kaudulla, Minneriya and Girithale and also many minor irrigation schemes. IP area has 3 segments, 8 Agrarian Service Centers and 35 AI ranges. The arable land extent in IP area is 34,840 ha. Number of farm families involved in agriculture are 46,092.

Progress

2016/17 Maha

Paddy

During 2016/17 Maha season targeted extent of paddy cultivation was 34,750 ha which included 26,200 ha of major irrigation, 6,410 ha minor irrigation and 2,140 ha of rain fed lands. Total cultivated extent under all three irrigation systems were 34,420 ha .

Lack of rainfall throughout the year badly affected on paddy and other agricultural production in Polonnaruwa district in 2016/17 Maha season. Paddy cultivation under Girithale project was zero while only 50% of the area was cultivated in Elahera. Due to above reasons total paddy production was drastically declined. Paddy production in 2016/17 Maha was 123,528 mt .The

contribution to the national production in 2016/17 Maha season was 8.5%.

OFC

During 2016/17 Maha season targeted extents of OFC cultivation was 981 ha. It included 250 ha of Chilli, 65 ha of Cowpea, 320 ha of Maize, 150 ha of Groundnut, 25 ha of Red onion, 61 ha of Green gram, 55 ha of Finger millet, 25 ha of Black gram and 30 ha of Gingelly. Achievements of the OFC extents were 132 ha of Chilli, 52 ha of Cowpea, 207 ha of Maize, 116 ha of Groundnut, 16 ha of Red onion, 46 ha of Green gram, 47 ha of Finger millet, 33 ha of Black gram and 35 ha of Gingelly. This brought the total cultivated extent of OFC during the season to 684 ha.

2017 Yala

Paddy

During 2016 Yala season targeted extent of paddy cultivation under major and minor irrigation were 25,220 ha and 4,780 ha respectively. Cultivated extents were 25,220 ha under major and 4,730 ha under minor irrigation conditions. Total cultivated land area was 29,950 ha. Production obtained from that extent was 177,335 mt. The average paddy yield under major, minor and rainfed irrigation schemes were 6 mt/ha, 5.5 mt/ha and 5 mt/ha respectively.

In 2017 Yala season there was no paddy cultivation in Elahera and only 50% of land was cultivated in Minneriya. Paddy production in 2017 Yala was 123,956 mt.

OFC

During 2017 Yala season targeted extents of OFC cultivation was 830 ha. It included 160 ha of Chilli, 220 ha of Maize, 50 ha of Green gram, 20 ha of Black gram, 50 ha of Cowpea,

20 ha of Finger millet, 150 ha Big onion and 80 ha Soya bean. Achievements of the OFC extents were 72 ha of Chilli, 161 ha of Maize, 31.34 ha of Green gram, 6 ha of Black gram, 22.9 ha of Cowpea, 7.19 ha of Finger millet, 48.1 ha of Big onion and 15.75 ha of Soybean. This brought the total cultivated extent of OFC during the season to 364.28 ha. Reason for low achievement is water scarcity.

Fruits

There is a continuous increase in banana cultivation in the Polonnaruwa, IP area. New extent of cultivation of fruit crops in this year was 67 ha of Banana, 78 ha of Mango and 46 ha of Papaw. Fruit plants for 89 fruit villages were distributed to the farmers. In both seasons 237 training classes have been conducted on fruit cultivation.

Vegetables

Low country vegetable crops are mostly cultivated in this region. 109 ha of Okra, 63 ha of Brinjal, 108 ha of Long bean and 73 ha of Pumpkin have been cultivated during the year. 268 training classes on vegetable cultivation have been conducted in both seasons. 144 ha have been directed for vegetable cultivation under agro wells.

Highlights

- The main extension strategy for paddy in this year was yaya 02 program. During the year only 71 yaya in Maha season and 97 yaya in Yala season were continued due to lack of rainfall. This program was started with promoting land preparation with the onset of rainfall and followed by implementation of demonstration in each yaya such as deep ploughing, fertilizer application with using leaf colour charts,

IPM, IPNS, mechanization etc. Overall 1,326 training classes and 130 field days were conducted on paddy cultivation.

- Third season green gram bean cultivation in Kawdulla (120 ac) and Girithale (600 ac) was successfully implemented.
- 17,222 bu of seed paddy was purchased under urgent seed paddy purchasing program from 176 farmers.
- In both seasons 785 training classes and 46 field days were conducted to promote OFC cultivation.
- 87 training classes were conducted on food and nutrition, local food promotion, kitchen management and entrepreneurship development. To promote local foods among the community ‘Hela bojun’ sales center was opened in district secretariat premises providing entrepreneurship to 05 farm women.

TRAINING UNIT

The main responsibility of training unit is supervising and monitoring of training activities conducted by all training centers attached to Extension and Training Center.

According to the present requirements training programmes are planned and organized by this unit. Providing guidance and coordination for National Vocational Qualification 3/4 level training programs conducted by the training centers is also carried out by training unit.

Specific information regarding Training Centers are given below.

IN-SERVICE TRAINING INSTITUTE- GANNORUWA

In-Service Training Institute, Gannoruwa, is the main agricultural training institute at national level which is responsible for keep abreast with information ,innovations, technologies and develop skills in the extension staff of the DOA. To accomplish this extension staff of DOA is trained to improve their knowledge and skills including communication skills. The systematic and comprehensive training of field staff at the In-service Training Institute helps to improve their performance. Number of training programs targeted and conducted during the year were shown in table 3.1.6.

Table 3.1.6: Number of training programs targeted and conducted during 2017 at ISTI, Gannoruwa

Training	Annual Target		Progress	
	No. of Trainings	Man days	No. of Trainings	Man days
Training of Agriculture Officers attached to DOA	74	7150	76	7696
Training of Other Institute Officers	14	920	22	2699
Training of Farmers, Students & Others	46	3320	97	5292
Workshop/ Seminar/ Meeting/ Discussion (Department of Agriculture & Other Departments)	65	3250	92	5870
ASDA Conference (Department of Agriculture)	01	2000	02	2427
Total	200	16,640	289	23,984

Highlights

Held the Annual symposium of the Department of Agriculture 2017.

IN-SERVICE TRAINING INSTITUTE, ANGUNAKOLAPELESSA

This training Institute is responsible for improving Agricultural knowledge, skills and attitudes of agricultural officers, entrepreneurs, farmers and others interested in Agriculture. The mission of ISTI, Angunakolapelessa is to keep the field extension staff updated on new technologies to raise their professional competence and educating them continuously for changing conditions in agricultural sector.

This Institute offers In-service training for officers in Agricultural sector mainly in Galle, Matara, Hambanthota Districts and Hambanthota Inter provincial area. Induction training, refresher training, pre-seasonal training are the common types of trainings usually conducted. Farmer training programs are also conducting by the training center.

ISTI, Angunakolapelessa endeavors to popularize other modern technologies which relevant to Agriculture as field demonstrations in 8 ha land area belongs to it. The demonstration field consist of 1 ha of paddy, 0.23 ha of vegetables and roots crops, 0.72 ha of fruits, 0.8 ha of coconut, 0.05 ha of home garden, 0.0176 ha area of net houses, 0.03 ha of nursery for planting material production. The ISTI has a Post harvest & Food Processing Unit and major tasks undertaken by this unit included providing food technology trainings for officers and small to medium scale entrepreneurs. Apart from that, ISTI provides advisory services on plant protection in Crop clinics for farmers.

In addition to that, Plant nursery development assistant (NVQ level - 4) training program was conducted ISTI Angunakolapelessa.

Progress

The total number of training programs conducted were 70 (3,409 man days) and it included 43 programs (2,267 man days) for DOA officers, 01 program (139 man days) for other Institutional officers, 01 program (17 man day) for general agriculture, 05 programs (156 man days) for entrepreneurship development, 01 program (32 man days) of farm machinery training for farmers and 02 programs (68 man days) for students/ schools, Technical Colleges. Other than those programs 07 (400 man days) workshops/ seminars/ meetings/ discussions and 07 programs (296 man days) for outdoor training activities were conducted.

The subject areas of above officer training programs conducted were crop production (Paddy, Fruit cultivation, Vegetable & root crops, OFC, Floriculture, Plant protection) Human resource development, Post harvest technology/ Food technology, Pre seasonal trainings and other (Young Farmer Club, Bee keeping, etc.)

IN-SERVICE TRAINING INSTITUTE, HANSAYAPALAMA - ARALAGANWILA

The In-Service Training Institute, Aralaganwila is situated in Mahaweli block B which is conducting training programs for extension staff of Sri Lanka Mahaweli Authority, Department of Agriculture as well as other government and non-governmental officers. The land area of the training center is

well maintained as a demonstration field by cultivating OFC, vegetables, root crops and fruits in both seasons. The institute conducts the course of training Field Assistant in Agriculture (NVQ 4) for school leavers.

Progress

In the year 2017, NVQ level 4 Field Assistant training course was conducted for 13 School leavers. 02 preparatory meetings for MASL preseasonal training were conducted.

FARM MECHANIZATION TRAINING CENTRE

Farm Mechanization Training Centre (FMTC) is the sole national level training institute for farm machinery in Sri Lanka. The institute was established in 1971 with collaboration of West German federal government and the Sri Lankan government. The institute is situated in Puliyankulama, Anuradhapura. Total land extent of the institute is about seventeen (17) hectares which covers with paddy, coconut, fruits, vegetables, driving track, training field and other utility buildings.

Vision of the institute is “To become the center of excellence in training on farm mechanization in Sri Lanka.” Mission of the institute is “Creating skillful farming community with appropriate mechanization for sustainable development in Agriculture”

Training mandate of the FMTC mainly focused on following aspects,

Operation and maintenance courses.

- Vocational Training on Operation and maintenance of four wheel tractors- 10 days
- Operation and maintenance of four wheel tractors- 5 days

- Operation and maintenance of two wheel tractors- 5 days
- Operation and maintenance of water pumps- 10 days
- Operation and maintenance of sprayers- 10days
- Operation and maintenance of harvesting , threshing machine and combine harvesters -2 days
- Operation and maintenance of Power trans planter -3 days

Repair courses

- Repair of two wheel tractor (K75) engine and transmission system -10 days
- Repair of water pumps -5 days

Micro irrigation courses

- Micro irrigation introductory course - 3days
- Application and Designing of Micro irrigation for commercial Agriculture - 5 days

Other courses

- Agricultural hand tools
- Home gardening

Target groups as follows,

- Officers from Department of Agriculture and Provincial Departments of Agriculture.
- Officers from the other institutes
- Farmers
- Students from schools/ universities/ Agriculture Schools/ Technical Colleges

Number of training programs targeted and conducted at FMTC during the year 2017 were shown in Table 3.1.7.

Table 3.1.7: Number of training programs conducted during 2017 at FMTC, Anuradhapura

Activity	Target		Progress	
	NT	MD	NT	MD
1. Officer Training Programme (DOA and PDOA)	08	500	04	273
2. Officer Training Programme (other institutional staff)	05	250	07	339
3. Farmer Training Classes	12	750	12	837
4. Field Training Programme	25	2800	54	6560
5. Workshop, Seminar/Meeting And discussion	02	50		
6. Outdoor Training activities	05	200	05	267
Total	57	4550	82	8276

NT- Number of Trainings

MD – Man Days

THE CENTRE OF EXCELLENCE FOR ORGANIC AGRICULTURE - MAKANDURA

Main functions of The Centre of Excellence for Organic Agriculture, Makandura are,

- Innovation of environmentally friendly agriculture technology
- Training and awareness program on organic agriculture and organic fertilizer production
- Certification process for compost fertilizer and organic crops
- Develop and maintain organic agriculture and organic fertilizer demonstrate at Agro Park

Progress

Training

- 63 training programs were conducted and 7,193 trainees participated. Those trainees included farmers, Extension Officers, compost producers and other relevant groups.
- 06 Workshops conducted.

Compost Production, development of new machine and production unit

- 200 tons of compost produced
- Developed compost pile turning machine which was needed to compost production
- Established other organic fertilizer production units such as wormy compost unit, Bio char unit, paddy husk char unit and compost tea unit.

Development of CEOA, Makandura

- 10 acre land was developed with proper drainage and irrigation facilities and 02 km internal road.
- Construction of the dining hall completed for trainees
- 2 ac and 1ac land cultivated with fruit crops and vegetable crops respectively.
- Wild Sunflower and Gliricidia plants were established covering 1ac extent
- All workshop tools were purchased.

Research Activities

- 05 research studies completed for quality development of compost.

- 03 research studies were started and on-going for development of organic packages for Pineapple, Guava and Passion Fruit

Certification Process for compost

- Certification procedure was implemented and all documents needed were printed.
- 3 Producers were certified and certification procedure was ongoing to certify 50 more producers

Highlights

- 1 exhibition held on 14th, 15th and 16th of December 2017 to aware public.
- The special project, Promotion of organic fertilizer production and utilization which was funded by Ministry of Agriculture was implemented by this unit.

HORTICULTURAL CROP TRAINING & DEVELOPMENT INSTITUTE – BIBILE

Horticultural crops training and development institute is situated in Monaragala district,

Bibile AGA division. It was established in 1st of April 2003 by joining the Sri Lanka School of Agriculture Bibile and research farm of Bibile.

The main objectives of the institute are as follows,

- Introduction of new technology on horticulture
- Production of different fruit plants with new technologies.
- Functioning the activities of Sri Lanka school of agriculture Bibile
- Conducting NVQ 3/4 level training course - Nursery Assistant program
- Conducting training programs with new technology - for Government officers, NGO officers, farmers and students (Schools/ Universities).
- Clone conservation
- Maintaining training and production oriented demonstration field.
- Field experiment on new recommendation.

Summary of the training progress in 2017 is given in Table 3.1.8.

Table 3.1.8: Number of training programs conducted in HTDI Bibile during 2017

Type of Training	No. of Training programs		No. of Man Days	
	Target	Progress	Target	Progress
Officer Training (DOA & PDOA Staff)	08	02	200	68
Farmer Training	40	05	1000	1173
Field Training	24	18	960	1640
Total	68	15	2040	514

Targeted programs cannot be conducted due to scarcity of training officers.

Other activities

- 19 trainees were recruited for NVQ 3/4 level nursery assistant course and they completed the institutional training and joined for OJT .

- 46 students followed NVQ level 5 Agriculture Production & Technology course in School of Agriculture Bibile. .
- Rehabilitated 2 ha extent of old mango cultivation
- Rs 4 million profit earned through fruit plant production program

knowledge of farming community, School Children as well as Officers of DOA, PDOA, Other Government and Non Government institutions. Since 2015, DATC has been conducting NVQ level 4 Field Assistant (Agriculture) training course for school leavers who completed G.C.E (O/L). This course comprised 6 months institutional training and 6 months on the job training.

DISTRICT AGRICULTURE

TRAINING CENTRE -

WEERAVILA

District Agriculture Training Center (DATC), Weerawila is mainly responsible for implementing training activities to educate and uplift the

Progress

Summary of the training progress in 2017 is given in the Table 3.1.9.

Table 3.1.9 Number of training programs conducted in DATC, Weerawila in 2017

Category of training	Annual target		Progress	
	No. of programs	No. of Man-days	No. of programs	No. of Man-days
Officer Training (DOA & PDOA Staff)	02	50	03	95
Officer Training (Other Institutional Staff)	04	160	01	21
Farmer Training	06	100	20	450
Field Training	06	200	02	147
Workshop, Seminar/ Meeting & Discussion	04	160	02	84
Outdoor Training Activities	02	40	-	-
Total	24	710	28	797

Under the NVQ 3/4 training program, 12 participants who enrolled in 2016 were completed their institutional training during 2017 and they were released to On the job training. In October 2017 new group of students recruited and they were under going Institutional training .

DISTRICT AGRICULTURE

TRAINING CENTRE - WAVINNA

District Agriculture Training Centre, Wavinna is located in Ampara district in a Coconut Cultivation Colony. This institute provides trainings on Agriculture know-how for farmers, Officers, School students and others.

Training progress of the center is shown in Table according to technical action plan.

Table 3.1.10: Number of training programs targeted and conducted in DATC, Ampara - 2017

Main Activities	Target		Progress	
	No. of training	Man days	No. of training	Man days
Officer training program DOA	20	236	05	122
Officer training program other institutional staff	04	60	03	184
Famer training program	44	580	25	539
Field training program	16	13	300	394
Work shop	06	95	02	76
Outdoor training activities	09	115	05	341
Total	99	1099	340	1656

DISTRICT AGRICULTURE TRAINING CENTRE - POLONNARUWA

Polonnaruwa District Agriculture Training center located near Kaduruwela city in Thamankaduwa Divisional secretariat. Cultivated area in the training center is about 4.5 ac .This area is maintained as a model farm and crops cultivated in the farm are Paddy, OFC, vegetables and fruits. Model home garden, animal husbandary unit and mushroom cultivation unit in the farm are also help to popularize new technology.

During the year 2017, a total of 44 training programs were undertaken (1,411 man days) and this included 24 programs for officers (940 man days), 20 programs for farmers (447 man days) and 40 out door training programs (922 man days).

Other than above training NVQ3/4 level Nursery Management Training Course was conducted for 05 students.

DISTRICT AGRICULTURE TRAINING CENTRE - ADDALACHCHENAI

The District Agricultural Training Centre is located in Addalaichenai divisional secretariat area. With the aim of improving agricultural knowledge with practical aspects of the farmers, school children, teachers and other officers in the area, training progrms are conducted by the training center. Vegetables and other field crops are cultivated in the DATC field successfully. These fields are well maintained as demonstration fields to provide knowledge to farmers and other trainees.

Table 3.1.11: Number of training programs conducted in DATC, Addalachchenai-2017

Activity	No. of training Programs		No. of man days	
	Target	Progress	Target	Progress
	Officer Training (DOA & PDOA)	06	06	360
Officer Training (Other institutes)	03	04	180	142
Farmer training classes	25	14	1020	458
Field training program (Students & farmers)	03	02	140	59
Workshop/seminar/meeting /discussion,	02	02	120	75
Out door farmer training	03	02	120	36
Total	42	30	1940	972

Highlights

- Agriculture Mobile Service Program was conducted at DATC Addalaichenai with the participation of Agriculture Departmental technical staff of Addalaichenai and Sammanthurai and Nintavur segment, farmers and other institutional officers in the area. Services provided by this program were seed sales from SPMDC, technical advice from Coconut Cultivation Board, introducing new hybrid seeds by private companies and GAP implementation program was carried out at the DATC.
- To enhance the practical knowledge of Mushroom cultivation, training program was arranged for DOA technical staff, farmers, and other institutional staff.
- With the aim of formation of farm women society, entrepreneur training program was conducted to farm women at Addalacchenai Divisional Secretariat area. This program was carried out with the collaboration of DOA and South Eastern University of Sri Lanka. It is expected to recruit these women entrepreneurs at newly established 'Hela bojun' sales center at Oluvil university (SEUSL).

- Awareness programme about Permanent Crop clinic was conducted for DOA technical staff
- Conducted Sustainable Agriculture Programme for Agriculture teachers of Akkaraipattu Zonal Education unit.
- Conducted honey bee colony transfer program at Oluvil with the participation of farmers and officers at Addalaichenai divisional secretariat area.

WOMEN AGRICULTURE EXTENSION PROGRAMME (WAE)

Mission of Women Agriculture Extension Program is to improve nutritional security and social status of farm families through increasing women's contribution for Agriculture development of the country in Agricultural production as well as service sectors.

Promotion of local food, introduction of entrepreneurship promotion programs for women, Promote better home environments, establish and strengthen women's organizations are among the major services

provided by the program. Women Agriculture extension program is implemented at grass root level by Subject Matter Officers (WAE) attached to the office of the deputy Director (Extension) in each district.

Extension activities performed in 2017.

- Two ‘Hela bojun’ sales centers were opened at Jaffna and Nittambuwa. Establishment of these centers, job oppournities were created for 50 new women entrepreneurs.
- With the aim of increasing local food consumption among school children three School canteens were converted to function as ‘Hela bojun’ outlets. Canteens of Visaka Vidyalaya, Colombo 04, Hilwood College, Pushpadana Girl’s School and Vidyartha College, Kandy are the four canteens converted as ‘Hela bojun’ sales centers. Number of women entrepreneurs recruited for above centers are 20.
- Two canteens at General Hospital, Kandy and South East University, Oluvil were are also converted in to function as ‘Hela bojun’ sales centers. For these two salse centres 45 women entrepreneurs were recruited.
- Subject matter officers of WAE in island wide (35) were trained on women agriculture extension activities and nutritional food promotion programs.
- Twenty five new women’s agricultural extension organizations were established all over the country.
- Fifty seven training classes were conducted for 1,522 women entrepreneurs all over the country. Out of this, 360

women have been working in newly established 31 private ‘Hela bojun’ outlets.

- Participated for 01 exhibition and 04 seminars under the theme of promotion of local healthy foods.
- To introduce and popularize local food recipes which are unpopular in society, 01 video program was recorded and telecasted.
- Three television programs (Ranbimata arunella, Nuga sewana) were telecasted on development of entrepreneurship and Food festival 2017.
- Food festival 2017 was conducted in Plant Genetic Resource Centre at Gannoruwa, with the participation of 06 Inter Provincial areas and 09 provincial areas. Objective of this festival was to make collection of rare food recipes and exhibit the biodiversity which can use for food preparation in those areas.
- Construction works of 06 ‘Hela bojun’ sales centers at Mathara, Chillaw, Trincomalee, Padiyathalawa, Wakare and Kanthale were ongoing.
- Provided equipments (02 bottle coolers, 02 juice dispensers, 20 tables and 80 chairs) for newly opened 02 ‘Hela bojun’ sales centers at Nittambuwa and Jaffna.

AGRO ENTERPRISE DEVELOPMENT & INFORMATION SERVICE

The Division of Agribusiness counseling (DOAgbiz) also known as Agro Enterprise Development and Information service under Extension & Training Centre of Department of

Agriculture is the focal point for agri-business and agro entrepreneur development activities in Department of Agriculture. DOAgbiz implements agro entrepreneur development activities through different approaches. Major programs handled by the Division of Agribusiness Counseling are as follows.

Progress

Initiatives on enhancing safety and quality of Agri food products by adapting Good Agriculture Practices (GAP)

The project of Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local and export markets through GAP was implemented through Division of Agribusiness Counseling (DoAgbiz).

The main duties and responsibilities of the officers attached to the DoAgbiz are instructing, inspecting, and monitoring of the whole value chain from the field (soil and seed) up to the retail markets when it comes to local market aspect and up to exit point which is National Plant Quarantine Service (NPQS) gate when it comes to European export market in order to assure the quality of products. Their duties also include prepare weekly based cropping calendar to maintain a backup volume to ensure the consistent supply.

By this unit 1,707 training programs were conducted including public awareness, farmer and officer trainings islandwide on GAP practices. 155 SL-GAP certified farms were formed. 23 government GAP demo farms were established islandwide. Additionally, 39 GAP farmer cooperatives were established. 2,204 farmer information were gathered for the

farmer database and 82 media programs were conducted including TV and radio programs.

Good Agricultural Practices (GAP) is being introduced on crop basis for fruits and vegetables. Producers are registered and certified at DOAgbiz as quality assured suppliers while DOAgbiz acts as a data hub to provide necessary information to the parties concerned. With the successful implementation of GAP project export of fruits and vegetables for European market was promoted. And also safety and quality of consignments assured. By that it was able to minimize rejections from export market. Bitter gourd 191.8 mt, Snake gourd 109.17 mt, Mango 12.98 mt and Guava 3.28 mt were exported to European market in 2017.

Agribusiness Program

The project of Commercial farming and Agribusiness development with youth attractions was implemented through Division of Agribusiness Counseling (DoAgbiz). 12 Agro entrepreneurs were benefited on (50% farmer contribution basis) for various agri-based ventures. One training program was conducted on farmer business school (FBS).

Capacity building programs for interested parties to become Agro Entrepreneurs

DOAgbiz organized and conducted Agro Entrepreneurship development courses in each year. There are 14 different modules which gives theoretical and practical aspects of becoming a successful Agro Entrepreneur. This module covers a wide range from on farm cultivations, value addition and identification of potential agribusiness and proposal writing.

Under this programme 297 trainees (686 man days) were trained. 50 number of project proposals based on commercially valued Agro enterprises for potential entrepreneurs issued on request.

Farm development and productivity enhancement technical consultancy services

DoAgbiz offered its services to develop underutilized commercial level farms. The proprietor can make formal request with the details of the current status of the property and express the interest. Afterwards the institute will select a group of experts according to the interest to visit the farm and technical recommendation to meet the intended production.

Monitoring & technical assistance to collaborative agricultural service station called “Krushi Sewa Piyasa” (KSP)

KSP has established by DoAgbiz in the previous years with the aim of providing special services or normal inputs and advisory services required for the market oriented farming were monitored.. Minimizing the incidences of usage of inappropriate chemical and other inputs for agriculture is one of the major objectives of this project. DoAgbiz has provided technical assistance to KSPs.

Linking the services of the Department of Agriculture

Entrepreneurs who seek technical information and services of the DoA, such as seed certification, plant quarantine, laboratory

testing and extension services were supported by DoAgbiz through proper coordination.

SL-GAP CERTIFICATION UNIT

SL-GAP certification is basically dealing with management system certification of fruit and vegetable production with all island coverage including provincial governments, interprovincial and Mahaweli areas in order to ensuring the food safety by introducing a process to ensure quality and hygiene of the food, environmental sustainability, economic productivity and social acceptance of vegetable and fruit cultivation.

The SL GAP certification division is responsible to appraise the requirements and specifications for certification through continuous monitoring and auditing of all small, medium and large scale farms registered under SL GAP procedure.

Progress

Number of fruit farms and vegetable farms certified are 96 and 60 respectively. Altogether 156 farms were certified by the unit during the year.

Highlights

Awareness programs on Market potential of fruit & vegetable production through SL-GAP certification were conducted to farmers and consumers.

BEE DEVELOPMENT UNIT, BINDUNUWEWA - BANDARAWELA

Bee keeping Development unit is responsible for the Development and Extension of bee

keeping among farmers. Following facilities are provided by the unit to disseminate modern apiculture technology.

- Conducting training to farmers, officers, students etc.
- Manufacturing bee keeping equipment.
- Training and registration of bee keeping equipment suppliers and certification.

- Providing technical support for government and non-governmental institutions to implement bee keeping projects.
- Providing technical support for research work.
- Collecting annual bee keeping and honey production data in Sri Lanka.

Progress

Table 3.1.12: Progress of training programs and maintenance of bee colonies - 2017

Activity	Trainee Category	Number of training programs	
		Target	Progress
Bee keeping training programs	Officers	06	07
	Farmers	10	23
	University students	-	04
	Students	-	1,048
Production of bee keeping equipment training	Entrepreneurs	04	03
Maintenance of bee colonies	honey production	500 kg	328.25 kg
	Colony	250	230
	maintenance		

Progress of bee honey equipment production - 51 bee boxes, 133 smokers, 27 brood frames and 5,686 queen guards were produced by the unit during the year.

Highlights

- Construction of new lecture hall building was completed.
- Conducted a field day program to share the new technology with farmers .
- New bee colonies were produced using queen rearing technique

HEADQUARTERS OF YOUNG FARMERS CLUB (YFC)

Young farmers clubs are the village level institutions of the young farmer's clubs movement. Other components belongs to the young farmers' clubs movement are district level primary consultative committee, provincial level consultative committee, and national level federation. Relevant activities are planned, and implemented by these committees at different levels with the participation of membership. The overall coordination is done by the headquarters of the Young farmers clubs movement. There are nearly three thousand Young Farmer's clubs formed and one third of them are registered at the headquarters.

Progress

Table 3.1.13: Number of program conducted YFC

Activity	Sub Activity	Target	Progress
Training program	Training programs for YFC members	480	400
	Training programs for officers	60	50
	Introduce commercial agricultural projects for YFC members	240	200
Meeting	Primary Advisory Committee	30	20
	Provincial Advisory Committee	09	05
	National Federation	01	01
Programs conducted by YFC'S	Cultural programs	1,000	900
	Religious programs	500	420
	Educational programs	200	180
	Social programs	1,000	950
Radio programs	Radio Quiz Competition	52	-
Establishment of New YFC	ASC Areas	1,000	1,550
	YFC/ Mahaweli Areas		
	YFC/ School YFC		
Media/ Publicity	Islandwide publicity programs through Electronic and printed media	160	140
Total		4,732	4,816

Highlights

- Established 800 school young farmers clubs
- Established an organic fertilizer production center at Elpitiya.
- Produced special TV program on YFC

WATER MANAGEMENT & PROTECTED AGRICULTURE UNIT

This unit is dealing with following subjects in respect of technology generation & dissemination to the technical staff of the Department Of Agriculture, Other departments

and institutes, Private sector and to the farming community in Sri Lanka.

- Agricultural adaptation technologies to mitigate climate change
- On farm irrigation & irrigation management
- Micro irrigation technology & fertigation technology
- Controlled environment agriculture (Protected Agriculture- Poly tunnel, Rainout shelters, Net houses)
- Commercial farming (Advanced planning of commercial farms) for annual and perennial crops
- Hydroponic culture & advanced nursery management

In order to facilitate the above process relevant books booklets, handouts and presentations were prepared. Providing the required technical knowhow for the establishment of small to large scale commercial farms also a vital role in this unit. In addition to that provides technical support for the farm

development programs using micro irrigation and protected Agriculture. Ministry funded projects also successfully carried out by this unit while helping to carried out other programs conducted by Department of Agriculture such as Crop leader program.

Progress

Table 3.1.14: Technology generation & dissemination by Water Management and Protected Agriculture Unit

Activities	Progress
1. Training programs for officers & farmers on Micro Irrigation Technology and Protected Agriculture, Climatic Change Adaptation	23
2. Preparation of Estimate, Evaluation report for Micro Irrigation System & Protected Houses	48
3. Ground water surveying for agro wells by using resistivity meter on the request of farmers or institutes	60
4. Farmer Survey on Assessment of Existing Fertigation Protocols with respect to their Marketable Yield in Different Agro Ecological Regions- NARP research project	85
5. Provide technical information & participation for Mass Media Programs	13
6. Attending technical meetings of other institutes	21
7. Preparing of power point presentations, handouts & booklets on Micro Irrigation, Protected Agriculture & Adaptation of climate change	07
8. Participating as resource persons in Agriculture Mobile service in ETC and as requested by other institutes	13

- Introduction of agricultural adaptation measures for climate change
- Introduction of artificial lighting in green house for continuous production

Design and preparation of estimates of protected houses and micro irrigation systems

Provided designs and specifications of irrigation and protected houses for government, semi government, private sector institutes and farming community.

Highlights

Technical messages were given for mass media programs especially,

- 'Kandurata' radio program
- 'Swadeshi' radio program
- 'Rangiri ran diyawara' radio program and 'Lankadeepa'/'Sirikatha' newspapers

PLANNING & PROGRESS

MONITORING UNIT

The main responsibility of Planning and progress monitoring unit is preparing action

plans for all financial and technical activities of ETC and monitoring the progress of those activities.

During the year 2017 annual action plans for capital allocations of all sub units of ETC were collected and compiled by Planning and Progress Monitoring unit. Other than above activities all action plans relevant to technical activities and special projects were also collected and compiled by the unit. Preparation of monthly progress reports of capital, recurrent and special projects allocations and technical activities of ETC were also carried out by this unit. Monthly progress reports of Capital recurrent, technical and special projects comes under DOA votes were prepared and sent to PMEU DOA and progress reports of special projects comes under MOA votes were sent to monitoring cell of DOA. The unit also involved in providing information for Annual performance report of the Department of Agriculture, Central Bank report, Parliamentary Budget speech and disseminating information to relevant agencies. Proposals received to submit for annual budget also compiled by the unit. Considering the request made by all sub units of ETC distribution of budget allocations among all sub units considering their request was carried out by the planning unit. Provide information relevant to ETC under Right to Information Act is also carried out by the unit.

EDUCATION UNIT

Education unit of the Extension and Training Center is facilitating to provide effective and efficient agricultuel education to produce middle level human resources required by the agriculture sector of the country. The schools of Agriculture, which conduct the National

Vocational Qualification (NVQ) level 6 Higher National Diploma in Agriculture Production Technology (HNDAPT) course and NVQ level 5 National Diploma in Agriculture Production Technology (NDAPT) course are supervised and monitored by Education unit .

NVQ level 6 course is conducted in 5 schools of Agriculture namely Kundasale, Pelwehera, Angunakolapelessa, Vavunia and Karapinchcha. The two year Agriculture Diploma which offered previously by these schools was converted into NVQ level 6 Higher National Diploma in Agriculture Production Technology (HNDAPT) course from 2013. This course comprises two year institutional training and 6 months on the Job training while NVQ level 5 National Diploma in Agriculture Production Technology (NDAPT) course comprises one year institutional training and 6 months on the Job training. After completing the institutional training students must start the On the job training with the guidance of NAITA. Those who succesfully completed the On the Job Training have to face for the competency based assesment conducted by TVEC. NVQ certificates will be awarded to the students who passed the competency Based Assesment. Quality management system (QMS) was also introduced to all the shools of Agriculture.

There are 6 NVQ level 5 schools and those schools are located at Anuradhapura, Bibila, Paranthan, Palamunai, Labuduwa and Wariyapola. Both of those NVQ level 6 & 5 courses are conducted in English medium in all the schools of Agriculture.

During the year there are 588 students were following HNDAPT in the NVQ level 6 Schools and 207 student are following the

NDAPT in the NVQ Level 5 schools. Altogether 795 students are following the course residentially by the end of year 2017.

Ensure the periodical revision of syllabus and curriculum of the Higher National Diploma and National diploma in Agriculture Production Technology to suit the timely requirements of the Agricultural industry of the country with the collaboration of NAITA is another responsibility of this unit. The technical support for development and amendment of competency based training (CBT) curriculum was entirely provided to the UNIVOTEC (University of Vocational Technology) by this unit. In addition lesson plan and scheme of training were developed according to the CBT curriculum for both NVQ level 6 & 5 courses.

During 2017 two Diploma awarding ceremonies were held.

1. On 22nd June 2017, NVQ Level 6 certificates were awarded to students who passed out from the schools in 2015. Number of students awarded the certificates were 213.
2. On 24th November 2017 both NVQ Level 6 & NVQ Level 5 qualified students were awarded certificates. 404 NVQ Level 6 qualified Students who completed the institutional training in 2016 and 2017 and 340 NVQ Level 5 qualified students who completed the institutional training in 2016 and 2017 were also received their certificates on this day.

Specific information regarding NVQ Level 6 Schools of Agriculture are given below.

SCHOOL OF AGRICULTURE, KUNDASALE

The school of Agriculture, Kundasale is located in Divisional Secretary's Division Kundasale of Kandy District of the Central Province. The school can be identified as a pioneer institute in agricultural education in Sri Lanka. Total extent of lands belonging to the institute is 31.6 ha and out of them 19.48 ha have been brought under crop cultivation. The school has been gradually developed up to the present situation during the past period. The school has all infrastructure facilities to impart knowledge to students, with various fields of agriculture. In addition, Agricultural Engineering unit, Animal Husbandary Unit, Mushroom Cultivation unit and farm for skill development of the students. The school has lecture halls which have been equipped with modern audio visual accessories and laboratories. The school maintains a library having a valuable collection of books and periodicals. In addition meteorological unit located in the school premises facilitates the academic activities of the students. Since the diploma is a full time residential course, all the students are provided with residential facilities. There are four hostels in the school and two hostels for girls and boys each have been allocated.

During the year 2017, infrastructure facilities of Schools of Agriculture Kundasale, have been improved through completing the construction of new academic building including Library, IT facilities, Auditorium, Conference hall and academic staff rooms.

SCHOOL OF AGRICULTURE, ANGUNAKOLAPELESSA

The school is located in Hambanthota district of the southern province and it was started in 1980. This institute consist of 32 ha of farm premises and 3.5 ha of school premises. These land extents are very useful for the student's field practical demonstrations as well as to supply food products for hostel consumption. Not only the production harvested from the crops cultivated in the farm but also the eggs, milk and meat supplied from animal husbandary unit are being countinously supplied to fulfill the requirement of hostel.

Progress

- During the year 5 ac land area of the farm was developed with establishing coconut cultivation.
- Established 0.5 ac GAP certified mango cultivation and 0.25 ac leafy vegetable cultivation.
- To fulfill the requirement of animals in the farm, 1 ac grassland established.
- 7 ac extent of paddy land cultivated and 10.2 mt of harvest received.
- Farm office and 04 rooms of girl's hostel were repaired.
- Construction of new auditorium building was started and 50% of the work completed.

SCHOOL OF AGRICULTURE, PELWEHERA

The school of Agriculture, Pelwehera is located in Matale of Central Province. It was incepted in 1981 at the seed farm, Pelwehera. The total extent of land belonging to this school is 27.4 ha. The crops established in this

area are paddy, fruits, coconuts, vegetables, cereals etc. Paddy field area of the school is 12 ac and it is cultivated in both Yala and Maha seasons. The production harvested from the paddy field is provided to hostel for consumption of students. This production is enough to fulfil hostel requirement throughout the year. There is a mother plant orchard of 2 ha extent consisting Mango Citrus, Pomegranate etc. Animal husbandry unit is also well maintained to conduct students practicals.

Infrastructure facilities of the school was improved during last couple of years by completing constuction work of three storied hostel complex and acedemic building.

At present school offer the Higher National Diploma in Agriculture Production Technology with residential facilities for students. There are 3 hostel buildings to accomadate students. During the year the number of students following the course were 138.

Other than conducting Diploma course, training programs regarding new agriculture technologies were conducted for school children, teachers, and farmers with their request at school.

Institute gain some income by selling excess production of plants, animal products, vegetables and fruits for outside.

Progress

Field work is mechanized with new machines introduced in 2017. Introduced machines were paddy trans planter, machine weeder and new 4 wheel tractor.

SCHOOL OF AGRICULTURE, VAVUNIA

School of Agriculture, Vavunia is situated in Tandikulam of Vavunia district and it was established in 1989 by the North Eastern Provincial council to meet the demand of technical officers to disseminate new agricultural information to tamil speaking farmers. The school management was taken over by the Department of Agriculture (Central Government), Peradeniya in 1994. The school has field plots covering 10 acres of land for practical purposes. At present school offer the Higher National Diploma in Agriculture Production Technology with residential facilities for students. There are 4 hostel buildings to accomadate students.

Progress

During the year 2017 repairing of roof and rewiring work for kitchen, dining hall, library, farm office and main store building complex was completed. Other than that repairing of mushroom shed, animal unit and net house was carried out. Construction of septic tank was also completed. Developed bee development unit of the school and established Tom EJC plants under GAP program.

Highlights

Won 3rd place at divisional level for Dengue free premises competition conducted by Department of Health Services, Vavuniya.

SCHOOL OF AGRICULTURE, KARAPINCHA

School of Agriculture, Karapincha is located in Divisional secrtery's Division, Kuruwita in Ratnapura District of Sabaragamuwa Province. The total extent of lands belong to the school is 8.16 ha. The lands belonging to the school has been cultivated with OFC, vegetables, Rambutan, Orange, Lemon, Pineapple cultivtion and small scale tea, coconut and cinnamon plantation.

The institution incepted in 1958 as a practical farm school and it was upgraded to a District Agriculture Training Center. Later it was handed over to the Sabaragamuwa Provincial Council and again it was established as school of Agriculture, Karapincha under Department of Agriculture (Central government). During the period of 1994-1998, two batches of diploma holders have been produced. In the yer 1998 a training programe for Agriculture Research and Production Assisants was conducted. From the year 2007 again two year Diploma in Agtriculture course was started in the school and continuing up to now.

Number of students following the NVQ Level 6 course in above 5 schools as at December 2017 are given below.

Table 3.1.15: Number of students following the NVQ Level 6 course in above 5 schools as at December 2017

School of Agriculture (NVQ level 6)	Number of students in each Academic year				Total
	1 st year (2017/19)		2 nd year (2016/18)		
	Girls	Boys	Girls	Boys	
Kundasale	40	72	25	80	217
Angunakolapelessa	27	26	6	38	97
Pelwehera	32	43	32	38	145
Vavuniya	17	10	27	16	70
Karapincha	-	35	-	24	59
Total	116	186	90	196	588

Specific information regarding NVQ Level 5 schools of Agriculture are given below.

SRI LANKA SCHOOL OF AGRICULTURE, LABUDUWA

Sri Lanka School of Agriculture, Labuduwa was started in 1994 to conduct two year Agriculture Diploma course. This course was conducted in the institution up to year 2000. Later one year practical Agriculture training course was conducted for Agriculture Research and Production Assistants in Department of Agrarian Development. Around 350 ARPA's were trained from 2005 to 2013. NVQ 3/4 Level 'Edible landscaping and urban agriculture' course was started for school leavers during 2014 and it continued in 2017. In 2015 NVQ level 5 National Diploma in Agricultural Production Technology course was started in the school.

Conducting short term training programs for officers, farmers and school students is another function of the school. Land area of the school is maintained as a demonstration field for these trainees. Technical staff of the School is engaged in providing solutions to field

problems of farmers when requested. School is providing opportunities for students who followed agriculture related courses to complete their OJT.

Progress

- 38 students who followed the NVQ level 5 National Diploma in Agricultural Production Technology course were completed the institutional training and joined for OJT. New batch which comprises 38 students were recruited to follow the course during 2017.
- 16 students who followed the NVQ 3-4 level Edible landscaping and Urban agriculture course were completed their institutional training and started OJT. Conducted Final year examinations for NVQ-3-4 students.

Highlights

- Participated in two TV programs (Rivindina arunella & Govi bimata arunalu) and 3 radio programs
- Awareness of job opportunities for diploma holders

- Engaged in providing solutions to field problem of farmers when required

SRI LANKA SCHOOL OF AGRICULTURE, WARIYAPOLA

Sri Lanka School of Agriculture, Wariyapola, is situated in Kurunegala District. This school is conducting NVQ level 5 National Diploma in Agriculture Production Technology course. Thirty eight female students were studying the course during the year 2017. Demonstration field of the school is well maintained by the students for their field practicals and production obtained from the fields are supplied to the hostel for the students' consumption and the excess production is sold by the sales outlet.

Six months Plant Nursery Development Assistant course (NVQ level 3/4) is also conducted by the institute and fifteen students were enrolled for the course. Bee development activities were conducted by bee keeping unit established within the premises of school. Services provided by this unit were conducting training classes, demonstrations, supplying bee colonies and bee boxes.

Extension officers who are conducting Good Agricultural Practices Program within North Western Province are also attached to this school. By those officers agricultural knowledge dissemination through field visits, field demonstrations, radio and television programs were conducted giving special attention to Good Agricultural Practices.

SRI LANKA SCHOOL OF AGRICULTURE, BIBILE

Sri Lanka School of Agriculture, Bibile was started in 1994 to conduct two year Agriculture Diploma course. This course was conducted in the institution up to year 2000. From the year 2000 to 2003 short term training courses were conducted. On 1st of April 2003 Horticultural crops training and development institute was established by joining the Sri Lanka school of agriculture Bibile and research farm HORDI Bibile. Later one year practical Agriculture training course was conducted for Agriculture Research and Production Assistants in Department of Agrarian Development. Activities of Sri Lanka school of agriculture re-started in this institute in 2015 to conduct one year NVQ level 5 National Diploma in Agriculture Production & Technology course. During the year 46 students were followed NVQ level 5 Agriculture Production & Technology course in School of Agriculture Bibile.

SRI LANKA SCHOOL OF AGRICULTURE, PALAMUNA.

This School of Agriculture was started on 6th of April, 2015 by converting DATC Palamunai as the School of Agriculture. Third batch of the students to follow NVQ level 5 – National Diploma in Agricultural Production Technology course was recruited in 2017. Number of students recruited were 28. During the year the function was held to celebrate farmers week with the participation of students and farmers in the area. NVQ level 5 certificates were also awarded to the 1st batch of students passed out from the school in the above function.

SRI LANKA SCHOOL OF AGRICULTURE, ANURADHAPURA

Sri Lanka School of Agriculture, Anuradhapura has been established on 2nd May 1994 to conduct two year Agriculture Diploma programme. After that the school converted to special training institute in 2002 and delivered large number of short term training programs for government officers, farmers and school children etc. In 2005, the institute started one year practical Agriculture training course for Agriculture Research and Production Assistants in Department of Agrarian service. The School of Agriculture offered One year practical Agriculture Certificate course for Mahaweli Field Assistants and short term trainings in 2013. In 2014, short term training programs were conducted for officers & school students and in 2015, NVQ 3/4 – Field Assistant (Agriculture) course was started for students who have O/L qualifications. In 2016, NVQ level 5 – National Diploma in Agricultural Production Technology course

was started and during 2016/ 17 aademic year 36 students followed the course and successfully completed the diploma course in March, 2017. For 2017/18 aademic year 34 students were recruited.

SRI LANKA SCHOOL OF AGRICULTURE, PARANTHAN

Sri Lanka school of Agriculture, Paranthan which was established in 2016 is located in Kilinochchi district. The school is providing good opportunity to get National Diploma in Agriculture Production Technology with NVQ level-5 certificate for students who live in Nothern Province. First batch of student consist of eighteen students completed their Institutional training and appointed for OJT (On the Job Training). The infrastructure facilities of the school was improved during the year.

Number of students following the NVQ Level 5 course in above 6 schools as at December 2017 are given in Table 3.1.16.

Table 3.1.16: Number of students following the NVQ Level 5 course in 6 Schools of Agriculture

School of Agriculture (NVQ Level 5)	Number of students		Total
	Girls	Boys	
Labuduwa	16	24	40
Wariyapola	40	-	40
Bibile	40	-	40
Palamuna	18	10	28
Anuradhapura	34	-	34
Paranthan	12	13	25
Total	160	47	207

EXAMINATION UNIT

The examination sub unit conducts various examinations for officers of the DOA while

handling all semester end examinations of 11 schools of agriculture annually. Fifteen Departmental Examinations and efficiency bar

examinations have been held by the examination sub unit and the number of candidates sat for these examinations were 1562 by the end of 2017.

The limited and open examinations for recruitment for the post of farm clerk was held and the number of candidates sat for aforesaid examination were 3361 during the period 2017.

In addition, the examination for admission to the NVQ level 5 schools of agriculture for the academic year 2017-2018 was held and total number of candidates sat for the examination was 750. 3200 applications were received for NVQ level 6 school admission and Examination unit was select the eligible candidate from the application to sit for the exam which was conducted by the Examinations Department.

Exams regarding one year practical training program was conducted for Agriculture Research & Production Assistants (ARPA) who have been attached to the Department of Agrarian Development since 2005.

PLAN FOR 2018

- Agricultural extension programs in 6 Inter-Provincial areas
- The focus for 2018 will be to enhance the productivity of the major crop paddy grown in IP areas to ensure food security of the country. Paddy productivity improvement program will be implemented island wide under National Food Production program.
- Increase the cultivation extents and productivity of Other Field Crops will be emphasized as a solution to cut down

imports & save foreign exchange. Island wide special program will be implemented under National Food Production program to increase the extents, production & productivity of OFC.

- Production of fruits will be enhanced through rehabilitation programs and introduction of agro ecologically suitable fruit varieties.
- Promotion of GAP in vegetable cultivation
- Conduct Higher National Diploma in Agricultural Production Technology NVQ level 6 courses at all 5 Schools of Agriculture. Around 286, NVQ 6 level diploma holders will be passed out and a new batch will be recruited for the course.
- Conduct National Diploma in Agricultural Production Technology NVQ level-5 agriculture course at Schools of Agriculture Wariyapola, Labuduwa, Palamuna, Bibile, Anuradhapura and Paranthan. Around 207 students will be passed out and a new batch will be recruited for the course.
- Conduct NVQ level 3-4 training courses at Schools of Agriculture Labuduwa & Wariyapola, HTDI Bibile, ISTI Angunakolapelessa, ISTI Hansayapalama and DATC Weerawila.
- Conduct agriculture training programs for officers and farmers at three In-Service Training Institutes, four District Agricultural Training Centers, Farm Mechanization Training Centre, Bee Development Unit and HTDI Bibila.
- Conduct following exams according to the exam calendar of year 2018.

- Examinations of Higher National Diploma in Agricultural Production Technology & National Diploma in Agricultural Production Technology
- Departmental examination for officers of the Department of Agriculture
- Competitive examinations for recruitment of students to Schools of Agriculture - NVQ level 5
- Efficiency bar examinations for offices of the Department of Agriculture
- Examinations for awarding scholarships for the government officers who will be selected to the Schools of Agriculture.
- Selection examination for NVQ Level 5 diploma holders to NVQ level 6 course (2nd year of two year HND course).
- Conduct training programs for Young Farmers Clubs members.
- Conduct Women Agriculture Extension programs
 - Establish two 'Hela bojun' sales centers in Katugasthota and Batticaloa and one stop farmer outlet at existing 'Hela bojun' centers
 - Training of DOA officers
 - Training of new entrepreneurs for new 'Hela bojun' sales centers,
 - Preparation of training aids such as booklets and flip charts.
 - Dissemination of technology through radio programs, television programs and exhibitions.
 - Establish women production societies and provide processing machineries.
- Provide basic equipment and other necessities for 'Hela bojun' sales centers
- Maintain and further development of existing 'Hela bojun' centers (Chilaw and Trincomalee) including land development and landscaping
- Conduct Agri business counselling programs
 - Establish and strengthen farmer cooperatives and provision of materials on 50% farmer contribution basis (Insect proof nets, plastic crates, pruning equipment and fruit cover bags, fruit fly control traps and baits, safety kits will be on free of charge).
 - Formation and facilitation of fruits and vegetable farms and OFC farms under SL-GAP
 - Provide assistance to convert conventional farms into GAP farms (Provide polyhouses for farmers in specific areas on 50% farmer contribution basis; provide support for pesticide and fertilizer stores, etc.)
 - Strengthening central hub and 25 district GAP promotion units(purchase portable pH and EC meters, etc)
 - Establish a pack house with cold room facilities, hot water dip equipment, etc.
 - Provide district mini laboratories rapid test kits to diagnose MRLs
 - Officer and farmer training programs
 - Widening SL GAP standards (Paddy and OFC)

- Establish SL-GAP outlets in major cities
- Improvement and maintenance of farmer information data base including payment for telephone allowance (80 CAb & Tabb officers)
- Island wide Awareness program (Establish bill boards, leaflets & posters)
- GAP field supervision, pack house auditing, internal auditing
- Agri-entrepreneurship development training program
- Providing technical assistance for commercial farm development
- Conducting farmer business school (FBS) program at inter-provincial areas
- Empowering young agro entrepreneurs project implementation
- Conduct micro irrigation and protected agriculture activities
 - Increase awareness of officers and farmers on Climate change adaptation measures, Protected Agriculture and Micro irrigation by conducting trainings & workshops
 - Take a part on National Food Production program by introducing year around fruit & vegetable production under protected house and open field cultivation with micro irrigation
 - Conduct farmer participatory research regarding fertilizer use in protected culture and application of artificial lights in green house for year around production
- Providing specification for protected houses and micro irrigation systems.
- Preparation of printed materials on related subject
- Mass media programs
- Conducting bee development activities at Bee Development Unit at Bindunuwewa and sub units
 - Mobile training programs for farmers, members of bee keeping societies/ villages in IP areas and provincial areas.
 - Quality inspection of bee keeping equipment and knowledge improvement of producers island wide.
 - Hold a bee keeping exhibition at Bee Development Unit, Bindunuwewa.
- Conducting prganic agriculture related activities at Centre of Excellence for Organic Agriculture in Makandura
 - Certification process for compost producers – Target 500 producer
 - Complete the construction of soil microbiology laboratory and initiate practical on soil microbiology
 - Complete the construction of hostel facilities and Agro-eco park
 - Training and awareness programs to promote use of organic fertilizer and sustainable agriculture
 - Compost production - Target 200 tons
 - Develop compost production machine –Target 1 machine
 - Research on development of organic agriculture packages for selected vegetable and fruit crops including

fertility management; pest and disease control and weed management.

- Quality assessment and quality improvement of compost and other organic nutrient inputs

Special Projects

- Promotion of Entrepreneurship of members of Young Farmers Clubs Based on agriculture production program - 2018
- Introduction of other field crops as a substitute crop for Tobacco
- Construction of a new hostel Building - HTDI, Bibila
- Quarters facility development - ISTI, Agunakolapelessa
- Establish water supply system at In-Service Training Institute, Agunakolapelessa and upgrading District Agricultural Training Centre, Polonnaruwa
- Renovation of existing two hostel buildings at Farm Mechanization Training Center, Anuradhapura for the utilization of School of Agriculture.
- Enhancement of assessment capacity of the examination unit of the Department of Agriculture for productive human resource development.
- Development of Agriculture Schools conducting NVQ level 5 Agriculture Diploma Course in Department of Agriculture
- Development of school of Agriculture Paranthan conducting NVQ level 5 Agriculture Diploma Course in Department Of Agriculture
- Establishment of climate - smart model village for sustainable agricultural development.
- Improve Women Entrepreneurship while popularizing Mushroom production
- National Chilli development program
- Productivity improvement of Paddy cultivation
- Production and productivity improvement of Soya
- Promotion of off season cultivation of Green Gram/ Cowpea
- School development program
- Strengthening and implementing GAP program
- Home garden promotion program
- Bee keeping development project
- Empowering Young Farmer Entrepreneurs
- Establishment of well-developed center for quality assurance of organic fertilizer and organic products.
- Improve women entrepreneurship while improving nutrition status of people (Hela bojun)
- Production and productivity improvement of Maize
- Production and productivity improvement of Groundnut
- Construction of automated protected house for the enhancement of high value vegetable seed production with young entrepreneurs under renting facility
- Rehabilitation of existing Agro wells and introduction of climate smart agriculture (Pilot scale)

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	05
Deputy Director	20
Assistant Director of Agriculture (Development)	93
Lecturer (Contract)	04
Administrative Officer	03
Translator (English)	01
Agricultural Monitoring Officer	15
Program Assistant (Agriculture)	14
Development Officer	63
Librarian	01
Agriculture Instructor	309
Research Assistant	05
Public Management Assistant	91
Technological Assistant	245
Farm Clerk	05
Warden (Male)	07
Warden (Female)	05
Driver	63
Tractor Operator	12
Store Keeper	12
Plant Yard Attendant	06
Mechanic	05
Machinist	01
Carpenter	02
Electrician	01
Technician	10
Research Sub Assistant	02
Bee Keeper	07
Budder	07
Fitter	01
Steward	01
Cook	29
Circuit Bungalow Keeper	07
Lorry Cleaner	02
Office Employee	15
Waiter	02
Watcher	100
Laborer (Permanent)	509
Sanitary Laborer	04
Laborer (Contract)	106
Total	1,786

3.2 NATIONAL AGRICULTURE INFORMATION AND COMMUNICATION CENTRE (NAICC) - GANNORUWA

The Vision of the National Agriculture Information and Communication Centre (NAICC) is to 'achieve excellence in adapting Information and communication technologies for agriculture toward national prosperity of Sri Lanka' and the mission is to 'adaption of multiple media approaches, e-agriculture solutions and citizen centric information services to create more productive food crop sector'.

Objectives of the ICC are collection, compilation and dissemination of agricultural information through electronic and print

media, introduction of e-solutions with development of software solutions/database for information management and also to conduct Agriculture exhibitions and operate Agriculture Technology Parks to promote agriculture technology dissemination and Agro tourism.

Units under the NAICC are the National Agriculture Information and Communication Centre as the Director's office, Farm Broadcasting Service, Agriculture Publication Unit, Central Agriculture Library, Agro Technology Park, Gannoruwa and Bata atha.

BUDGET

Allocations received and expenditure incurred under different votes are given in Table 3.2.1.

Table 3.2.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	28,705,974	26,952,102	94
Capital	90,800,000	87,734,923	97
Projects			
• Media Program	30,000,000	30,000,000	100
• A-Park	5,000,000	4,964,726	99
• Fruit Village	108,400	102,165	94
• AFACI- ATIN Project	6,335,000	6,302,099	99
• Distribution of plant machineries to Agri organizations	3,160,500	3,358,771	107
• Organic Fertilizer Production & usage promotion program	3,500,000	3,020,845	86
• Annual Symposium of the Department of Agriculture (ASDA)	4,000,000	3,991,592	100
Total	171,609,874	166,427,223	97

PROGRESS

NATIONAL AGRICULTURE INFORMATION & COMMUNICATION CENTRE

Main objective of this center is to achieve excellent use of ICTs for Agriculture development in Sri Lanka. ICC director's office and NAICC amalgamated in year 2017 to function as Director's Office. Graphic Section, ICT Section, Agricultural Advisory Service section and Training Section were coming under the purviews of the NAICC.

Main responsibility of this NAICC are Coordinating and monitoring of the NAICC units to perform the ICT activities of the DOA. several information services will be strengthened through this centre. 'Govi Sahana Sarana' Agricultural Advisory Service has been extended from 4 call agents to 20 call agents and strengthened with ICT tools like Social media, (Face book page), Skype, Viber. WhatsApp, Imo, Line etc. New Mobile technologies will be initiated to support farmers to solve their problem. ICT initiatives have been implementing with the upgraded IT technology. Krushi FM web TV established in 2017 and telecasted 286 video clips up to December 2017.

New e-agriculture services identified by the 'Sri Lanka e-Agriculture strategy' will be implemented. The graphic unit with computer facilities is also established which design all print media materials for farmers. Designing and production of IMMCDs is also improved by these facilities. Training facilities are

upgraded with a separate computer lab and a separate auditorium with 250 seats.

In addition, "Agriculture Technology Information Network in Asia (ATIN)" project is implemented by NAICC. DOA Agri staff mobile app for 2016 which includes contact details of the DOA officers was prepared and uploaded in 2017. The ATIN Sri Lanka project has been selected again as the most outstanding ATIN project in AFACI member countries.

Services provided through this center are;

- Design and production of Agriculture publications, leaflets, posters, large format prints for hoardings and banners.
- Operating Agricultural Advisory Service "Govi Sahana Sarana Sevaya" (Telephone Short Code 1920).
- Developing and Updating websites; DOA website at new address (www.doa.gov.lk), Wikigoviya website (www.goviya.lk), Krushi Lanka Dwaraya (krushilanka.lk), AFACI-ATIN Sri Lanka website and BFN website Sri Lanka (www.bfnsrilanka.org)
- Developing and Management of Databases, Publication Unit Information System, Crop Forecasting Information System, GAP Certification System, 1920 Call Centre System, National Plant Quarantine Service, Human Resource Management and Seed Database
- Designing computer Network - Network Administration, Internet Access Administration and maintenance of system intercom
- Interactive Multimedia CD production on various crops and subjects

- Hardware and Software maintenance and troubleshooting.
- Maintaining of DOA social Media pages such as Facebook, Twitter, Youtube and Google Plus
- Conduct training on ICT, Audio Visual Teaching Aids and Presentation Technology

Progress

Training

Training programs- 47/ 1830 man days

Graphic Communication

Technical publications - 21

Leaflets/ Broachers - 86

Hoardings/Display boards - 09

Exhibition/ Research posters - 100

Paper supplements/Posters for offset printing - 20

Desktop presentation - 288 slides

Invitation Cards/Greeting Cards - 237

Labels/Stickers/Name Boards – 1,247

Institutes name boards -76

Banners - 21

Information Technology

Updated web pages – 1,008

Number of websites design completed - 06

Create new web pages -548

Database and software development – 5,569 hrs

Database trainings - 122 hours

Network administration - 274 hrs

Establishing network - 411 hrs

Hardware software maintenance - 448 Jobs

Network trouble shooting - 971 jobs

'1920' Agricultural Advisory Service

No. of queries handled - 49,938

Through Skype (Video calls) - 26

No of SMS handled – 318

Through mail/fax/email – 1,452

Development & maintenance of Elastix/ caller database -575 hours

Development & maintenance of 1920

Knowledge management system - 299 hours

Social media updating

Twitter - 722 pages

Facebook -721 pages

Google plus -530 pages

Video Uploading

Video - 99 programs

YouTube - 198 programs

AFACI ATIN Project

Agriculture Technology Information

Newsletters - 12

Crop Calendar as a book - 19,000 copies

ASDA research papers upload to AFACI

ATIN website - 83 papers

Books published on Vegetable IPM (S) and

Beekeeping (S)

IMMCD replicated on Bee Keeping

IMMCDs re-replicated - 08 IMMCDs

AGRO TECHNOLOGY PARK UNIT GANNORUWA (GATP)

In the year 2016, the institute AVC was upgraded as National Agriculture Information and Communication Center (NAICC). As a result, The Agro Technology Park Unit, Gannoruwa was established as a separate unit coming under the NAICC.

The Agro Technology Park Unit Gannoruwa is mainly responsible for production and broadcasting of agricultural video programs, conducting national and regional level agricultural exhibitions and maintaining

Gannoruwa Agriculture Technology Park to disseminate recommended new agricultural technologies as well as relevant traditional agriculture technologies, to enhance knowledge, skills and attitude of the public related to the agriculture. These extension activities give fullest supportive services to the main agricultural extension stream conducted by DOA and PDOAs.

Vision of the Gannoruwa Agro technology Park unit is to achieve excellence in dissemination and conservation of modern and traditional agricultural technologies for national prosperity

The mission of the Gannoruwa Agro technology Park and video unit is to provide efficient, effective, demand responsive and integrated agricultural extension services to facilitate public access to agricultural information and promote agro tourism with edible landscaping to utilize better know how, improve productivity, optimize profitability and ensure sustainability, thereby ensuring more citizen centric governance.

Objectives

- To disseminate timely important, demand responsive agricultural information among the public.
- To produce and broadcast two TV programs weekly and other video programs, advertisements, short notices covering modern and traditional technologies and success stories of the agriculture sector.
- To protect traditional and indigenous knowledge, technologies and visuals of special events related to the agriculture sector for future use.

- To conduct national level agricultural exhibitions representing DOA on demand basis.
- To promote edible landscaping as a measure to motivate home gardening activities in the country to ensure attractive environment, food security, nutrition and healthy food items.
- To promote concept of agro tourism in the country to conserve traditional agriculture, optimize profitability and ensure sustainability.

Table 3.2.2: Progress of A Park, Gannoruwa

Activity	Progress
Number of visitors	
School Children	64,736
Adults	38,754
Foreign visitors	297
Conducting exhibitions and Landscape designing	
Conducting exhibition site (DOA)	05
Conducting exhibition site (Other)	03
Designing exhibition. site (other official)	02
Landscape site designing (DOA)	05
Landscape site designing for (other official)	20
Landscape training	11
Poster service	10
Performing Art	
Performing street drama	02
Financial progress	
A park income	1,218,985.00
Sales center income	1,066,885.50
Other income (Auction)	60,605.00

Table 3.2.3 Progress of Video unit

Activity	Progress
Producing of TV documentaries	
Mihikatha Dinuwo	43
Govibimata Arunalu	53
Ketha Batha Kamatha	12
Others	61
TV commercial short message	13
YouTube short message	201
Broadcasting of TV documentaries	
Mihikatha Dinuwo	40
Govibimata Arunalu	51
Ketha Batha Kamatha	10
Others	02
TV commercial short messages	41
Other services	
Sound recording and editing for video programs	55
Digital photography	27,580
Copying videos on request	108

AGRICULTURE PUBLICATION UNIT

The broad objective of this unit is to disseminate appropriate agriculture technologies and other related information through print media among the end users. To achieve this broad objective Agriculture publication unit is responsible for the publishing and distributing printed materials of the Department of Agriculture to support field extension activities. Agriculture Press and Distribution center are comes under the purview of this unit. Agriculture press of this unit caters the entire printing requirement of the DOA and it includes technical and non-technical publications. In addition to this, it

undertakes the printing requirements of the Ministry of Agriculture. The Distribution Centre is responsible for distribution of printed materials for sales and free issues.

Progress

Rs 2.05 million rupees earned during this year from various activities. Nearly 1.59 million rupees earned by selling of publications and IMMCDs through the sale center of this unit and table 3.2.4 shows the details of the income earned from the sales center. In 2017 a total of Rs. 466,394.70 earned from selling of waste papers, other used materials and issuing of tender documents etc.

Table 3.2.4: Sales of Publications (Rs.)

Month	Income (Rs.)
January	75,519.6
February	63,499.00
March	63,494.00
April	275,070.00
May	37,106.00
June	210,735.80
July	152,767.00
August	201,324.00
September	192,211.00
October	120,632.00
November	114,783.00
December	82,414.00
Total	1,589,555.40

Following publications were produced during the year 2017. 16,500 copies Crop calendars (book format) were produced for paddy, other field crops and potato cultivation in Sinhala and Tamil languages under AFACI project.

Table 3.2.5: New Books Printed in 2017

Name of the Book	Number of Copies Printed
Govikam Sangarawa 47-4	4,017
Govikam Sangarawa 48-1	4,207
Govikam Sangarawa 48-3	3,979
Kamatolil Vilakkam 54-2.	657
Dragon Fruit (Sinhala)	2,511
Durian (Sinhala)	2,485
Farm Machinery (Sinhala)	2,500
Crop Calendars (Sinhala)	15,000
Crop Calendars (Tamil)	1,500

Table 3.2.6: Details of reprinted publications

Name of the Reprinted Publications	No. of Copies
Chili Cultivation (S)	2,000
Vegetable Cultivation (S)	5,000
Banana year round cultivation (S)	2,500
Leafy Vegetables (S)	4,950
Pulse Crops (S)	2,450
Budding (S)	3,518
Rambutan (S)	2,500
Hydroponics (S)	1,000
Underutilized Crops (S)	2,569
Field Problems of Paddy Cultivation (S)	2,460
Food Products of Mung bean (S)	2,500
Budding (T)	1,010
Tuber crops (S)	2,490
Mango Cultivation (S)	4,937
Organic Manure (T)	1,505
Bee Keeping (S)	1,400
Pineapple Cultivation (S)	5,000
Storage of Seed paddy (S)	2,500
Bite – Local Crops (S)	1,000
Jam – Local Crops (S)	1,000
Banana Cultivation (S)	1,000

Name of the Reprinted Publications	No. of Copies
Tomato Cultivation (S)	2,522
Disease Control for Other Field Crops (S)	1,986
Disease Control for Other Field Crops (T)	1,000
Mushroom Cultivation (S)	2,500
IPNS (S)	251
Total	61,548

AGRICULTURE PRESS

In addition to the above DOA publications, Agriculture press printed different types of printed materials including leaflets, posters and invitation cards etc. for other units of DOA and ministry of Agriculture. Entire seed certification labels and forms of the Seed Certification Service are printed at the press. Summary of the number of copies printed in the agriculture press is given in Table 3.2.7.

Table 3.2.7: Summary of the printed materials for other units

Type of Publications	No. of copies
Books and booklets for other Units (42 types)	79,283
Leaflets (35 types)	688,870
Posters	67,600
Invitation cards (14 types)	8,410
Home Garden seed packets	806,300
File covers (10 types)	11,588
Seed labels	809,750
Letter heads	68,500
Forms / Letters	172,943
Certificates	5,880
Agtec	7,510

Free issues of publications

Following number publications issued among technical staff of DOA and Provincial DOA during this year.

- Govikam Sangarawa
Volume 47 - 2 - 3,452
Volume 47 - 3 - 3,452
- Kamatolil Vilakkam
Volume 54 - 1 - 520
Volume 54 - 2 - 533
Volume 54 - 3- 600
- Tropical Agriculturist (Vol. 625-1) - 625
- Crop Calendars (Sinhala) - 3,919
- Crop calendars (T) - 480
- Newsletter 11 issues - 66,000 (6,000x11) posted through e-mail

FARM BROADCASTING SERVICE (FBS)

Vision of the unit is to achieve excellence in Radio Medium in Agriculture for National Prosperity and mission is to identify, produce and broadcast Agriculture Radio Programs to make food crop sector more efficient and effective to improve public access to Agriculture information and to create more citizen centric governance.

Objectives of the unit are:

1. Create awareness about more productive new agricultural practices among farmers
2. Make aware of problems encountered in farming and possible effective solutions for those problems

3. Create interest in agriculture as potentially profitable income generator

4. Generate positive attitude and recognition among farmers.

5. Make farming community aware of environmental and other hazardous consequences related to different agricultural practices

6. Provide platform for farmers to express their views and ideas with respect to agriculture related policies and strategies introduced by the relevant authorities

7. To promote home gardening activities in all homes in the country to ensure food security, nutrition and chemicals free food items

8. To make the agriculture a very attractive carrier to the young men and women in the country

Coordinating other media stations for DOA media needs are also handled by the Kandurata Unit of FBS. Under the other media coordinating activities, twenty seven "Ranbimata Arunalu" programs on ITN TV were produced and telecasted and four "Malarum Boomi" tamil programs were telecasted through Wasantham TV channel. forty seven 'Shadda TV' programs and thirty nine 'Rangiri' Sri Lanka programs were produced and telecasted

The main Farm Broadcasting unit is situated at Narahenpita, Colombo and three sub units at Anuradhapura, Kandy and Matara

These Units Broadcast radio programs in both Sinhala and Tamil medium via different radio channels. Many Radio programs are broadcasted in "Sandya Sevaya" special time belt on "Sinhala National Service"

Krushi FM web radio (www.krushifm.lk) has been implemented as the pioneer to establish a live Radio Channel for Agriculture in future

Programs produced by this unit are given below.

Table 3.2.8: Radio programs broadcasted in year 2017 (Under the Normal Media budget)

Day	Time	Radio Program	Format	Production Unit	Frequency
Monday	9.00-10.00 a.m.	Govithanata Peyak	Live Discussion	Colombo	FM 91.7/91.9
	6.35-6.50 p.m.	Govi Gedara	Magazine Program	Colombo	FM 91.7/91.9*
	6.45-7.00 p.m.	Ranketha Addara	Magazine Program	Anuradhapura	FM 91.7/91.9*
	7.10-7.15 p.m.	Sannasa	Current Agricultural Information (News)	Matara	FM 91.7/91.9*
	7.15-7.30 p.m.	Govisara	Magazine Program	Colombo	FM 91.7/91.9*
Tuesday	6.35-6.45 p.m.	Seilama	Recorded Program	Colombo	FM 91.7/91.9*
	6.45-7.00 p.m.	Kada Malla	Magazine Program	Matara	FM 91.7/91.9*
	7.00-7.30 p.m.	Koratuwa	Magazine Program	Colombo	FM 91.7/91.9*
	7.15- 7.30 p.m	Hariyata hari ethanata yamu	Recorded Program	Colombo	FM 91.7/91.9*
Wednesday	9.00 – 9.30 a.m.	Rajaratay Govibimay	Live Program	Anuradhapura	FM 107.3/90.1
	6.45-7.00 p.m.	Sara Boomi	Magazine Program	Colombo	FM 91.7/91.9
	7.00-7.15 p.m.	Saruketha	Magazine Program	Anuradhapura	FM 91.7/91.9*
	7.10-7.20 p.m.	Liya saraniya	Magazine Program	Colombo	FM 91.7/91.9*
	7.20-7.30 p.m.	Thirasara	Environmental Friendly cultivation practices (Role play)	Matara	FM 91.7/91.9*
	7.00-7.30 p.m.	Kurinchi Malahar	Magazine Program	Kandy	FM 107.3/107.5
Thursday	8.30-9.00 a.m.	Wayamba Gewatta	Live Program	Kandy	FM 90.1
	9.00-9.30 a.m.	Ruhunu Gewatta	Live Program	Matara	FM 107.3/107.5
	Last Thursday				
	9.00-10.00 a.m.				
	6.30-7.00 p.m.	Govijana Madala	Live Discussion	Colombo	FM 91.7/91.9*
Friday	7.00-8.00 a.m.	Veettu Thottam	Live Discussion	Colombo	FM 102.1/102.3
	8.00-9.00 a.m.	Aswanna	Live Discussion	Kandy	FM 107.3/107.5
	7.00-7.15 p.m.	Krushi Charika	Magazine Program	Kandy	FM 91.7/91.9*
	7.15-7.30 p.m.	Gangabada paththuwe karaliya	Drama	Matara	FM 91.7/91.9*
	7.00-7.15 p.m.	Muhaduhhal	Feature	Kandy	FM 107.3/107.5

Day	Time	Radio Program	Format	Production Unit	Frequency
Saturday	6.45-7.00 a.m.	Krushi Charika	Magazine Program	Kandy	FM 107.3/107.5
	8.00-8.15 a.m.	Govibima	Magazine Program	Kandy	FM 107.3/107.5
	7.30-8.00 p.m.	Thunaththa	Discussion	Anuradhapura	FM104.4/105.7
	9.15-9.30 p.m.	Ulavar Illum	Magazine Program	Colombo	FM 104.7/104.9
Sunday	6.30-7.00 p.m.	Wanna Marudam	Magazine Program	Colombo	FM 102.1/102.3
	9.45-10.00 a.m.	Boradiya Mankada	Magazine Program	Kandy	FM 107.3/107.5

* Broadcasted in Sandya Sevaya in Sinhala National service

Table 3.2.9: Special radio programs broadcasted in year 2017

Main Program	Production Program	Name of the Radio program	No of live program	Frequencies
BNF project	Popularization of local varieties	Sarapraba gira	01	FM 94.3/94.5

Table 3.2.10: Short messages broadcasted in year 2017(Under the Normal Media budget)

Day	Time	Radio program	Medium	Production Unit	Frequency
Monday to Friday	In between 5.50 a.m. and 6.20 p.m.	Govidathata Ape Saviya	Sinhala	Matara	FM 107.3/107.5
Monday to Sunday	In between 7.00 a.m. and 7.30 a.m. , In between 4.00 p.m. and 4.30 p.m.	Kalavita	Sinhala	Kandy	FM 107.3/107.5
Monday to Sunday	In between 6.15 a.m. and 7.15 a.m.	Athvala	Sinhala	Kandy	FM 104.4/105.7
Monday to Sunday	In between 6.00 a.m. and 6.30 a.m. , In between 6.00 p.m. and 6.30 p.m.	Aththama	Sinhala	Kandy	FM 90.1
Monday to Sunday	In between 6.15 p.m. and 7.30 p.m.	Short Message	Tamil	Kandy	FM 107.3/107.5
Tuesday, Wednesday and Thursday	In between 5.55 p.m. to 6.00 p.m.	Asvadduma	Sinhala	Matara	FM 107.3/107.5

Table 3.2.11 Special short messages broadcasted in year 2017(Under the Special budget)

Theme	Medium	Production Unit	Broadcasting Channel & Frequency
Promotion of usage of organic fertilizer and production	Sinhala	Colombo	Lak FM 106.0/ 106.2
	Sinhala	Colombo	Derana FM 92.2/ 92.4
	Tamil	Colombo	Wasantham FM 102.6/ 102.8
	Sinhala	Colombo	Sinhala National Service 91.7/ 91.9

Gathered island wide programs to listeners. Introduce "Listeners Club" concept and this listeners are awarded with training programs workshops and field visits to popularize the radio programs and to get their feed backs.

Other activities of Broadcasting Services

Additional to normal radio programs, all the units are involve in various other activities and maintain the web radio programs continuously.

Table 3.2.12: Other activities conducted during 2017

Unit	Activities	Venue
Colombo	Conducting Listeners Club program	2017.02.15 – Walpita DATC
		2017.04.07 – FBS Office Colombo
	Contributed by announcing and conducting PA	2017.06.30 – Makandura
		2017.10.27 - Ambepussa DATC
Ruhuna	Promotion of Farm Broadcasting Service activities among public, Coordinate awareness programs at village fair in surrounding areas.	2017.03.13 – Denipitiya
		2017.05.22 – Akuressa
		2017.06.21 – Agunakolapelassa
		2017.07.25 - Thawalama & Opatha
		2017.08.21 – Middeniya
		2017.08.22 – Bandarawela
Ruhuna	Involving in announcing and conducting public activities at exhibitions and field day conducted by DOA and Provincial DOA.	2017.09.26 - 2017.09.27 Bombuwala Rice Research Center
		2017.10.09 Akuressa, Diyalape, Malimbada
		2017.12.15 Agunakolapellassa
Kandy	Developing Krushi FM web radio Upload Video for YouTube Performing news by “Krushi FM news” website	NAICC/FBS Kandy
		Food Exhibition/ ASDA Seminar/ Convocation of Agri Diploma/ Opening Ceremony ‘Hela Bojunhala’, Nittambuwa
		Media coverage & radio broadcast

Unit	Activities	Venue
Kandy	External Media Coverage	Ranbimata Arunella – ITN Mal para - ITN Haritha Piyasa – Shraddha TV Randiyawara - Rangira Sri Lanka Radio Pasumei Eluchchi (Tamil) - Channel Eye/ Nethra Malarum Boomi (Tamil) - Udayam TV

Table 3.2.13: Radio programs broadcasted in 2017

Unit	Radio Program	Target	Progress
Colombo	Govithanata peyak	52	50
	Govi Gedara	52	48
	Govisara	52	48
	Sara Boomi	52	48
	Koratuwa	52	48
	Seilama	52	48
	Govijana Madala	53	48
	Liyasaraniya	52	47
	Veettu Thottam	52	46
	Ulavar Illum	52	50
	Wanna Maruadam	52	46
	Hariyata hari-Ethanata yamu		
	Short Messages (Fruit Fly)	464	464
	Short Messages (Organic Fertilizer)	440	440
Kandy	Aswenna	48	48
	Kalavita	730	730
	Krusha Charika	50	50
	News updates	120	120
	Kurinchi Malahar	52	52
	Muhaduhul	52	52
	Boradiya Mankada	12	12
	Wayamba Gewatta (1hr)	10	10
	Wayamba Gewatta (½hr)	37	37
	News updates (Wayamba)	120	120
Anuradhapura	Rajaratay Govibimay	52	48
	Saruketha	52	50
	Ranketha Addara	52	50
	Thunaththa	52	50

Unit	Radio Program	Target	Progress
Matara	Ruhunu Gewatta	49	49
	Asvadduma	156	156
	Thirasara	51	51
	Kadamalla	49	49
	Sannasa	50	50
	Govidathata Ape Saviya	502	502
	Gangabadapaththuwe Karaliya	52	51

Table 3.2.14: Listeners club training programs and workshops in 2017

Unit	No of trainings & workshops	
	Target	Progress
Colombo	06	06
Kandy	04	04

AGRO TECHNOLOGY PARK, BATA ATHA

As a quick information dissemination strategy and to promote agro tourism this Agro Park was established at Hambantota (Southern region) in the year 2007. This park is landscaped with edible plants (vegetables, root crops and fruits) which provide an aesthetically pleasing environment. A wide range of Information and Communication strategies (live field demonstrations, self explaining field instructional boards, facilitators for each demonstration site, instructional leaflets, IMM CDs etc.) are introduced here for disseminating agricultural information to all those who visit this site daily in thousands.

Agro Technology park, Bata atha under the Department of Agriculture is the best location to initiate appropriate programs to promote agro tourism in Sri Lanka. Such programs will definitely benefit rural farming communities

through creating income generating avenues and also benefits the country by improving tourism industry. Strengthening of Agriculture Technology Parks through agro tourism initiatives will strengthen the present technology transfer mechanism in Sri Lanka. When local and foreign tourists visit A-parks and adjoining villages, it directly or indirectly benefits many sectors involved in tourism industry.

Bata atha agriculture Technology park has different demonstration sites such as Rice garden, Leafy vegetable garden, Fruit orchards, underutilized fruit garden, Medicinal garden, Chena, Spice garden, Banana garden etc. in an aesthetically pleasing edible landscaping environment. Arched two hands, is the gateway to the park; a symbol of the shared labour.

One other important aspect of this garden is the facilitation provided for agricultural education. There are 19 facilitators within the ground to guide visitors. Unlike other normal gardens and parks in the world, service of facilitators (Agriculture Diploma holders) are provided to make aware farmers, school children, and other general public at each section of the park.

Progress

Table 3.2.15: Financial progress during 2017

Description	Income (Rs)
School Students	72,280.00
Other Students	61,530.00
Adults	612,260.00
Tourists' Children	2400.00
Adult Tourists	65,600.00

PLAN FOR 2018

- Establishing National Agriculture Information Network with all stakeholders
- Strengthening trainings on use of ICTs in Agriculture and presentation Media
- Strengthening "1920" Agriculture Advisory Services with Developing "1920 Crop adviser" mobile application covering all food crops.
- Establishing a SMS service to transfer the technology of 10 selected crops to registered farmers.
- Establishing Mobile Technology initiatives for Agriculture with all mobile service providers and combine with 1920 advisory service
- Maintaining Management information system for Crop forecasting, Seed database, BFN, Human Resource Management, Rice pest Analysis, GAP certification, NPQS Export Registry system.
- Establishing four Android mobile Apps for GAP, Vegetable Doctor, Fertilizer and rice doctor
- Establishing a full time Agriculture radio channel (Krushi FM) to strengthen the media activities of the DOA
- New radio programs like 'Hariyata hari Ethanata yamu', will be broadcasted through Sinhala National Service and 'Haritha Piyasa' will be telecasted through Shradda TV and radio. In Addition to these programs a new program will be produced to broadcast through Rangiri FM.
- Krushi TV which was started in 2017 will be live telecasted through social media and web telecasted for two hours per day.
- Awareness program through TV and radio and direct distribution channel will be designed to strengthen the distribution of the publications
- Increasing the production of Agriculture video programs and video clips telecast through different channels to ensure the dissemination of quick and relevant Agriculture information to farmers
- Improving the Central Agriculture Library of the Department of Agriculture as a digital library to make access to agriculture information services for stakeholders in Agriculture
- Promoting agro-tourism through agriculture technology parks, Bata atha and Gannoruwa
- Focusing all media activities mainly on the National Food Production Program (NFPP) and adopt multiple media approach

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	02
Deputy Director of Agriculture	02
Assistant Director of Agriculture	11
Information & Technology Officer	06
Agriculture Monitoring Officer	01
Program Assistant (Agriculture)	02
Media Assistant	02
Audio Visual Assistant	03
Development Officer	23
Agricultural Instructor	59
Public Management Assistant	15
Technological Assistant	25
Audio Visual Technician	01
Agriculture Extension Service Officer	13
Photographer	02
Farm Clerk	02
Artist	03
Driver	17
Tractor Operator	01
Storeman	04
Carpenter	01
Mechanic	03
Electrician	02
Video Editor	04
Audio Recorder	04
Machine Minder	03
Video/ Camera Photographer Assistant	04
Painter	01
Compositor	03
Book Binder (Press)	02
Lorry Cleaner	01
Office Employee	03

Designation	No. Existing
Video Lighting Assistant	04
Video Assistant	02
Demonstration Assistant	02
Video Editing Assistant	02
Watcher	31
Laborer (Permanent)	157
Sanitary Laborer	01
Laborer (Contract)	48
Total	473

4.1 ADMINISTRATION DIVISION - PERADENIYA

Administration division of the Department of Agriculture is comprised of two Director sections namely Administration and Establishments. The Administration Division includes an Additional Director General (Administration), Director (Administration), Director (Establishments) and three Assistant/Deputy Directors (Administration/Establishments).

This Division discharges all administrative matters of the overall department. The division

is comprised of 07 Administration Branches and 10 Establishments branches.

Head of the Administration Division is Additional Director General (Administration).

- Administration Section

The 07 Administration branches are under the direct supervision of Director (Administration). The Assistant Director (Administration) assists him to supervise the said branches as indicated in the following table.

Table 4.1.1: Branches under Director (Administration)

Supervision	Branch	Activities Performed
Assistant Director (Administration)	01	Human Resources Management
	02	Physical Resources Management
	03 (I)	Disciplinary Matters (Administration Div., SPMDC, HORDI, NAICC, Engineering. Div., NRMC, PMEU)
	05	Postal
	06	Translations and Legal
Assistant Director (Establishments)	07	Welfare
	03 (II)	Disciplinary Matters (ETC, RRDI, FCRDI, Finance Div., SCPPC, SEPC, FRDI)
II	04	Management Development, Training and Productivity Promotion

- Establishments Section

The 10 Establishment branches are under the direct supervision of Director (Establishments). The Assistant Director

(Establishments 1) and Assistant Director (Establishments 11) assist him to supervise the said branches as indicated in the following table.

Table 4.1.2: Branches under Director (Establishments)

Supervision	Branch	Activities Performed
Assistant Director (Establishments) I	01	Establishment Matters of Executive and Staff Grade Posts (SL 1, MN 7, MN 6)
	02	Establishment Matters of Tech: Services and Tech: Assistant Posts (MN 3, MT 1)
	03	Establishment Matters of Associate Officers and Management Assistant: (Non- Technical) (MN 4, MN 2, MN 1)

Supervision	Branch	Activities Performed
Assistant Director (Establishments) I	06	Pensions
	07	Scholarships
Assistant Director (Establishments) II	04	Establishment Matters of Primary Skilled/ Semi – Skilled Posts (PL 3, PL 2)
	05	Establishment Matters of Primary Non Skilled Posts(PL 1)
	08	Security Deposit
	09	Loan Applications
	10	“Agrahara” Applications

BUDGET

Allocations given and expenditure incurred under capital and recurrent are given in Table 4.1.3.

Table 4.1.3: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	24,030,341	25,886,404	108
Capital	28,588,503	25,924,231	91
Total	52,618,844	51,810,635	98

PROGRESS

Appointments

Recruitments for departmental posts were continued in year 2017. It led to reduce the staff deficiency of the Department. Details of recruitments carried out are given in Table 4.1.4.

Table 4.1.4: Appointments made during 2017

Designation	No. of appointments
Agriculture Extension Services Officer	12
Seed Technician	14
Technological Assistant	23
Contract Laborer	395
Total	444

Table 4.1.5: Number of new Posts Approved by the Department of Management Services in 2017

Designation	No.
Budder	80
Asst. Director of Agriculture (Agricultural Development) / Lecturer (English) - Contract	43
Laborer - Contract	503
Total	626

Promotions

Table 4.1.6: Promotions made during 2017

Designation	No.
Agricultural Instructor (Grade I to Special grade)	06
Agricultural Instructor (Grade II to I)	01
Agricultural Instructor (Grade III to II)	06

Designation	No.
Research Assistant (Grade I to Special grade)	01
Research Assistant (Grade III to II)	21
Farm Clerk (Grade III to II)	04
Public Management Assistant (Grade III to II)	07
Public Management Assistant (Grade II to I)	14
Total	60

Retirements

Table 4.1.7: Retirements during 2017

Designation	No.
Additional DGA (Research)	02
Director	06
District Director of Agriculture	03
Provincial Director of Agriculture	01
Additional Director of Agriculture	09
Principal Agriculture Scientist	02
Assistant Director of Agriculture	01
Administrative Officer	04
Agricultural Instructor (Special)	07
Agricultural Instructor	21
Research Assistant	06
Public Management Assistant	20
Engineering Assistant	01
Electrician	02
Technician	02
Driver	18
Mechanic	01
Cinema Operator	01
Farm Clerk	02
Research Sub Assistant	02

Designation	No.
Office Employee	05
Watcher	19
Cook	01
Seed Technician	03
Tractor Operator	05
Lorry Cleaner	01
Laborer	03
Budder	03
Circuit Bungalow Keeper	03
Storeman	01
Carpenter	02
Total	155

Deceased while in service

Table 4.1.8: Deceased while in service during 2017

Designation	No.
Engineering Assistant	01
Public Management Assistant	01
Driver	02
Tractor Operator	01
Budder	01
Laborer	01
Watcher	02

Release of officers

Table 4.1.9: Release of officers

Designation	No.
Officers released to other posts	
Agriculture Monitoring Officer	01
Development Officer	01
Agricultural Instructor	02
Research Assistant	02
Public Management Assistant	08
Technological Assistant (Extension)	06
Officers released to provincial Council	
Agriculture Monitoring Officer	01

Designation	No.
Development Officer	01
Agricultural Instructor	01
Research Assistant	02
Public Management Assistant	08

Table 4.1.10: Vacation of Posts

Designation	No.
Circuit Bungalow Keeper	01

Table 4.1.11: Resignation from Posts

Designation	No.
Program Assistant (Agriculture)	01
Development Officer	02
Public Management Assistant	05

Disciplinary Inquiries

Table 4.1.12: Disciplinary Inquiries during 2017

Category	Number of inquiries pending at the beginning of the year 2017	Number of inquiries initiated during the year -2017	Number of inquiries completed during the year - 2017	Number of inquiries pending as at 2017.12.31
Formal Disciplinary Inquiries/ Preliminary investigations	95	51	70	76
Government/ Internal Audit	0	02	0	02
Total	95	53	70	78

Table 4.1.13: F.R.104 Inquiries

Number of inquiries pending at the beginning of the year 2017	Number of inquiries initiated during the year 2017	Number of inquiries completed during the year 2017	Number of inquiries pending as at 2017.12.31
274	250	103	421

Amount of loans granted and types of salary advances

Table 4.1.14: Details of loans and salary advances

Type of loan	No. of vouchers Approved	Amount paid (Rs.)
Distress	1690	178,549,167
Bicycle	02	12,000
Property	46	780,138,202*

* Value of the applications forwarded to the bank

“Agrahara” Insurance Scheme

- Number of Applications submitted for reimbursement of hospital charges and Spectacles - 1,653
- Number of natural death claims submitted - 39

Security Deposits

- Number of persons whose security deposits released after retirement - 136
- Number of Public officers those who bail bond money - 1,083

Pensions

Details of the files received by the pension branch are as follows

- For payment of pensions - 314
- For death gratuity - 33
- For reversion of pensions - 58
- For the refund of W&OP Contributions - 12
- Obtaining of W & OP contribution (Pension Circular 3/2014) - 33
- For Release of minority receipts - 100

No. of officers granted Leave to be spent out of the island for Post Graduate Degrees

Ph.D. Degree

Assistant Director of Agriculture
(Agricultural Research) - 05

M.Sc.

Assistant Director of Agriculture
(Agricultural Development) - 03

No. of Officers returned after completing post-graduate Degree

Ph.D. Degree

Assistant Director of Agriculture
(Agricultural Development) - 01

M.Phil. Degree

Asst. Director of Agriculture
(Agricultural Economist) - 01

M.Sc.

Assistant Director of Agriculture
(Agricultural Development) - 02
Asst. Director of Agriculture
(Agricultural Economist) - 01

Release of officers to study within the island

Ph.D. Degree

Assistant Director of Agriculture
(Agricultural Development) - 01

M.Phil. Degree

Assistant Director of Agriculture
(Agricultural Research) - 01

M.Sc. Degree

Assistant Director of Agriculture
(Agricultural Development) - 02
Assistant Director of Agriculture
(Agricultural Research) - 01

B.Sc. Degree

Agriculture Instructor - 03
Research Assistant - 05

Completion of Degrees within the island

M.Phil. Degree

Assistant Director of Agriculture
(Agricultural Development) - 01

M.Sc. Degree

Assistant Director of Agriculture
(Agricultural Research) - 01
Engineer (Mechanical) - 01

B.Sc. Degree

Agriculture Instructor - 04

Officers directed for technological trainings within the island

Director - 01
Deputy Director of Agriculture
(Research) - 05
Engineer (Civil) - 02
Assistant Director of Agriculture
(Agricultural Research) - 74
Assistant Director of Agriculture
(Agricultural Development) - 01
Programmer Assistant - 05
Research Assistant - 09

Overseas visits for training, workshops and other conferences

Table 4.1.15: Overseas visits during 2017

Designation	No.
Director General of Agriculture	05
Additional Director General	05
Additional Director	17
Chief Engineer	03
Registrar of Pesticides	04
Director	25
Deputy Director of Agriculture (Research)	15
Deputy Director of Agriculture (Development)	13
Deputy Director of Agriculture (Agricultural Economist)	01
Asst. Director of Agriculture (Research)	75

Designation	No.
Asst. Director of Agriculture (Development)	50
Asst. Director of Agriculture (Agricultural Economist)	04
Asst. Director (Administration)	01
Engineer	13
Principal Scientist	06
Accountant	04
Translator	01
Administrative Officer	01
Agricultural Instructor	163
Development Officer	06
Agricultural Monitoring Officer	08
Economic Assistant	03
Technological Assistant	26
Program Assistant (Agriculture)	15
Engineering Assistant	01
Research Assistant	24
Technician	01
Research Sub Assistant	05
Soil Surveyor	01
Audio Visual Assistant	01
Video / Photographer Assistant	01
Bee Keeper	01
Laborer	01
Farmer	10
Total	510

Local Trainings

Table 4.1.16: Local trainings conducted during 2017

Training	No. of Officers attended
Programs of Productivity Development	703
Leadership and Attitude Development	141

Training	No. of Officers attended
Training of Minor Staff	322
Financial Regulations	97
Training on F.R.104(04) Inquiries	87
Training Program for Administrative Officer	35
Development of Attitudes Beyond the Limit	97
Total	1,482

This Division is the pioneer of the productivity program of the DOA.

Recoveries

- Total amount recovered by the government during the year 2017 from the officers who have vacated the post and have breached the agreements is Rs. 2,769,665.

PLAN FOR 2018

Efficiently perform the following duties assigned to above listed branches.

- Functions related to Recruitments
- Physical Resources Management
- Disciplinary Actions
- Functions related to Security Deposits, Loans and “Agrahara” Insurance
- Management Development and Training/Productivity improvement
- Functions related to Pensions of the staff members
- Maintenance of Personal Files
- Functions related to Local and foreign Scholarships

STAFF LIST

Designation	No.
Director General	01
Additional Director General (Administration)	01
Director (Administration)	01
Director (Establishment)	01
Assistant/ Deputy Director (Administration)	01
Assistant/ Deputy Director (Establishment)	02
Administrative Officer	04
Translator (English)	01
Translator (Tamil)	01
Legal Assistant	01
Development Officer	34
Public Management Assistant	87
Driver	10
Storeman	01
Office Employee	24
Watcher	08
Sanitary Laborer	02
Laborer	16
Laborer (Got permanent under Pub. Ad. Circular 25/2014)	04
Laborer (Contract)	10
Total	210

4.2 ENGINEERING DIVISION - PERADENIYA

The main objective of the Engineering Division is to provide and maintain infrastructure facilities promptly to achieve the objectives of Department of Agriculture. In order to fulfill the requirement of the Department of Agriculture the Engineering Division is facilitating with Farm Machinery Research Centre (FMRC) & four Regional Engineering workshops.

The main functions of the Engineering Division are as follows:

- A. Procurement of Capital Assets :
 - a. Civil engineering constructions
 - b. Procurement of Machinery, vehicles and Office Equipment
- B. Maintenance of infrastructure facilities:
 - a. Buildings and structures

- b. Vehicles and Machinery
- c. Office Equipment
- C. Farm Machinery research and development activities
- D. Other Services
 - a. Operation and Maintenance of drinking water supply scheme at Kundasale
 - b. Provide engineering advisory services to all Divisions of DOA

Repair & maintenance activities of vehicles and farm machinery are decentralized by establishing regional workshops in Peradeniya, Kundasale, Angunakolapelessa, Polonnaruwa and Seetha Eliya. Technological Assistants and Engineering Assistants were stationed all over the country in speedy implementation of Civil Engineering activities in the country.

BUDGET

The budgetary allocations and expenditure under different votes for the year 2017 are given in Table.

Table 4.2.1: Annual budget – 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Capital	11,565,199	10,888,456	94
Recurrent	30,006,732	29,036,036	97
Total	41,571,931	39,924,492	96

PROGRESS

Progress of Civil Engineering Activities

The activities carried out are as follows:

- New construction and repairs – This includes preparation of estimates , tender management and awarding contracts, work supervision and approval of payments

- Preparation of estimates to carry out the jobs by other Divisions– As per the requests made by the respective divisions only the estimates were prepared by the Engineering Division and the tender management were done by the respective division.

The summary of the Civil Engineering works carried out by the Division in 2017.

Requests Received

- New constructions: 135
- Repairs:164

Total work carried out:

- Minor repair in maintenance: 275
- Estimates prepared: 392

Table 4.2.2: The value of the civil Engineering works (Division wise summary) carried out during the year

Division/ Description	Awarded Value (Rs.)	No. of Activities
Administration Division	24,483,483.21	28
Finance Division	2,939,367.00	06
Rice Research & Development Institute	3,640,830.00	03
Seed Certification & Plant Protection Centre	19,726,357.90	22
Extension & Training Centre	16,616,169.56	62
Socio Economic & Planning Centre	2,350,587.50	01
Horticultural Crop Research & Development Institute	65,082,527.60	44
Seed & Planting Material Development Centre	180,443,110.79	60
Natural Resources management Centre	5,419,080.70	07
Field Crop Research & Development Institute	998,050.00	02
Engineering Division	1,746,225.00	06
Plant Genetic Resources Centre	5,849,774.03	12
National Information & Communication Centre	39,555,977.84	23
Farm Mechanization Research Centre	11,954,451.00	05
Fruit Research & Development Institute	13,302,892.72	13
National Plant Quarantine Service	5,991,400.50	11
Progress Monitoring & Evaluation Unit	2,565,603.00	02
Total Amount	402,665,888.35	307

Progress of Mechanical & Electrical Engineering Activities

The activities carried out in the year 2017 are as follows:

a. Procurement of Activities:

- Registering of garages & service stations
- Registering of suppliers

b. Vehicle repairs and maintenance 2017:

Table 4.2.3: Vehicle repairs and recommendations given

Location of workshop	Major Repairs	Minor Repairs	Recommendations	Work in Progress	Total
Kundasale	30	103	27	21	181
Head Office	4	240	1331	3	1578
Polonnaruwa	19	04	26	04	53
Angunakolapelessa	7	160	276	2	445
Seetha Eliya	7	80	22	23	132
Total	67	587	1682	53	2389

Table 4.2.4: Estimated cost of work done

Location of Workshop	Total Estimated Cost		Total
	Parts (Rs.)	Labour (Rs.)	
Head Office	2,153,963.95	1,357,870.00	3,511,833.95

Table 4.2.5: Vehicle Service

Location of Workshop	No. of Services Completed
Kundasale	71

Table 4.2.6: Division wise procurement of Machinery and Equipment

Division	Total Expenditure (Rs.)
Engineering Division	23,585,982.41
Finance Division	1,646,192.65
Administration Division	16,611,570.00
Extension & Training Division	16,946,584.75
Socio Economics & Planning Center	8,993,745.00
Seed & Planting Material Development Center	237,867,216.58
Seed Certification & Plant Protection Center	7,233,289.17
Rice Research & Development Institute	1,241,090.00
Fruit Crop Research & Development Centre	2,876,207.00
Information & Communication Centre	324,487.50
Field Crop Research & Development Institute	6,974,012.00
Horticultural Crop Research & Development Institute	33,112,300.39
Progress Monitoring & Evaluation Unit	898,320.00
Total	334,725,015.00

Table 4.2.7: Value of Goods Procured by the Engineering Division in 2017

Construction	Value (Rs.)
Civil Engineering Constructions	402,665,888.35
Procurement of Equipment	334,725,015.00
Total	737,390,903.35

Water Supply Scheme at Kundasale

This scheme pumps approximately 200,000 gallons of water from the Mahaweli river daily. The pumping station works 18 hours per day. This system caters to the various institutions under DOA as well as non-DOA

premises. Chlorinated water is supplied for drinking and domestic usage throughout the year while non chlorinated water is supplied to the lake of the agriculture farm during drought period according to the requirement.

This system is 45 years old and has been rehabilitated introducing new purification system and pumping system in order to maintain reliable drinking water supply.

Other Services

The Engineering Division assisted many Institutes, Centers and Units of the DOA by preparing estimates for building construction and repairs, supervising the work and scrutinizing and recommending of estimates for repair of vehicles, equipment and machinery. Inspection and valuation of condemned vehicles, machinery and equipment also carried out by the division. The division actively participated in technical evaluation and provided advisory services to the tender boards.

The working capacity, the efficiency and the performance of the Division were seriously affected due to lack of trained technical staff in the Division. There exist a number of vacancies in the cadres of technical staff. Owing to this constraint, numerous difficulties have been encountered in carrying out new civil engineering work as well as routine work such as operation of water supply scheme, Kundasala etc. At present, the division does not have a sufficient number of Engineering Assistants, Building Overseers and Draughtsman to handle the work load in the Civil Engineering section. However Technological Assistants recruited recently to the Engineering Division in 2014 are playing vital role in all activities.

PLAN FOR 2018

- Development of infrastructure facilities provided to the technical staff in Regional Offices and workshops
- Development of Regional Engineering workshops by introducing sophisticated equipments to enhance the services.
- Improving productivity concepts applied to office procedures
- Completing internal computer network and to introduce new work management software

STAFF LIST

Designation	No. Approved	No. Existing
Chief Engineer	01	01
Mechanical Engineer	05	04
Civil Engineer	04	04
Electrical Engineer	01	01
Administrative Officer	01	01
Engineering Assistant	11	07
Technical Officer	-	02
IT Officer	-	01
Development Officer	05	07
Public Management Assistant	15	13
Technological Assistants	10	27
Driver	06	07
Mechanic	21	18
Electrician	03	03

Designation	No. Approved	No. Existing
Machinist	05	07
Carpenter		02
Mason		00
Technician	Technician	07
Welder	12	02
Water pump Operator		01
Storeman	02	03
KKS	02	01
Watcher	06	08
Labourer	28	12
Total	138	135

4.2.1 FARM MECHANIZATION RESEARCH CENTER (FMRC) – MAHA ILUPPALLAMA

Farm Mechanization Research Center is located within the Mahalluppallama agricultural complex, about 35km from Anuradhapura. FMRC has been established to promote appropriate farm mechanization in Sri Lanka by introducing farm mechanization technology to reduce cost of production, improve quality enhance productivity & increase volume of agricultural product.

The major objective of FMRC is to introduce effective agricultural mechanization technologies compatible with the socio economic & field conditions prevailing in different parts of the Sri Lanka. The activities carried out by FMRC as follow.

- Identifying mechanization needs according to priorities & constraints in different farming systems
- Selection & testing of promising machinery & implements with regard to their constructions, their functions, safety and socio economic factors.

- Development, modification & adaptation of agricultural machinery & implements to suit local condition.
- Prepare technical drawings, test report & instruction manuals for selected implements
- Transfer technology to local manufactures & enhance their capabilities in production of appropriate agricultural machinery & implements.
- Helping agricultural extension & other agencies to popularize agricultural mechanization, technologies among farmers & other users.

The center has 06 sections

1. Research & development section
2. Testing & evaluation section
3. Agricultural & industrial extension section
4. Farm machinery maintaining & Repairing section
5. Technology transfer unit
6. Administrative section

BUDGET

The allocation and expenditure under different votes for 2017 given in Table 4.2.1.1.

Table 4.2.1.1: Annual budget - 2017

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,934,000	1,916,953	99
Capital	3,200,000	3,194,564	100
Projects			
• National Food Production Program	52,860,504	51,745,041	98
Total	57,994,504	56,856,558	98

PROGRESS

Research & Development

Table 4.2.1.2: Research projects & progress during the year 2017

Project Title	Aim of the Project	Progress
Modification of multi crop thresher as Groundnut pod removing machine	To introduced a Groundnut thresher with whole plant feeding system	On going
Groundnut decorticator	To introduce ground nut decorticator with high capacity and high cleaning efficiency	On going
Auto adjustable tine tiller coupled OFC seeder	Modify the tine tiller coupled OFC seeder to use in irregular land conditions	Completed
4W Tractor coupled Vacuum seeder	To introduce precise seeding method and seeder for small seeds such as Sesame, Finger millet	On going
Pulse processing machine	To introduce new pulse processing machine to remove husk and split pulse grain	On going
Seeder for paddy nursery	To introduce nursery seeder to evenly distribute seeds with recommended seed rate	On going
Parachute transplanter	To introduce transplanter for parachute trays	On going

Testing & Evaluation

Successfully contributed to develop new standard test codes and procedures by participating technical working groups and

general councils of ANTAM (Asian Network for Testing of Agricultural Machinery)

Following machines were tested and certified to the suitability for Sri Lankan Farming condition.

Table 4.2.1.3: Machineries tested during 2017

Type	Number of machines received	Approved	Rejected
Brush cutters	06	02	01
Power tiller	02	03	01
Maize thresher	01	-	-
Water pump	15	06	-
Combined harvester	-	01	-
Power sprayer	03	01	01
Hand sprayer	-	03	-
Tine tiller (4w implement)	-	01	-
Four wheel tractor	05	01	-
Cultivator	02	-	-

Type	Number of machines received	Approved	Rejected
Mamoty	02	-	-
Fertilizer applicator	01	-	-
Weeder	01	-	-
Boots	01	-	-
Electric fence	05	-	-
Manual seeder	2	-	-
Transplanter	01	-	01

Agricultural and Industrial Extension

A. Extension programs

Table 4.2.1.4: Extension programs conducted during 2017

Activity	No. of programs
Filed demonstration	11
Radio program	02
Exhibitions	04
Training program	19

B. Contribution to National Food Production Program

Provided technical assistance for distribution of farm machinery under National Food Production Program.

Table 4.2.1.5: Machineries distributed under National Food Production program

Name of the Machine	No. of Machines	Unit price (Rs.)	Total (Rs.)
Walk behind paddy transplanters	05	379,000	1,895,000
Power weeders	10	89,000	890,000
Laser leveler	02	1,450,000	2,900,000
Bund forming machine	01	949,000	949,000
FMRC designed 4w tractor coupled seeder	07	249,000	1,743,000
Rotary inter cultivator	14	28,348	396,870
High capacity Maize thresher	02	373,000	746,000
2WL ridger for Maize	06	8,400	50,400
Reaper Soy crop	01	1,495,000	1,495,000
Power tiller attached seeder	10	85,000	850,000
Grain polishing & splitting machine	22	90,000	1,980,000
Total	80	5,195,748	8,210,270

Farm Machinery Maintaining & Repairing Section

Farm Machinery Maintaining & Repairing section of FMRC carryout possible repairs, gives technical guidance and give recommendations regarding repairs for vehicles and farm equipments belong to Department of Agriculture.

Table 4.2.1.6: Farm machinery repairs conducted and recommendations given

Activity	Total
Number of recommendations	70
Number of repairs	16

PLAN FOR 2018

Research & Development

- Modification of multi crop thresher as ground nut pod removing machine
- Groundnut decorticator
- Advanced green house for paddy nursery maintenance
- 4W tractor coupled vacuum seeder
- Pulse processing machine
- Seeder for paddy nursery
- Parachute transplanter

Testing & evaluation

- Testing and evaluation of agriculture machinery handed over by suppliers and introduction of new technology stranded of agriculture machinery from international testing procedures.

Table 4.2.1.7: Types of machinery to be tested during 2018

Machines Type	No. of machines to be tested
Brush cutters	08
Two wheel tractor	02
Water pump	15
Power sprayer	04
Hand sprayer	01
Four wheel tractor	06
Transplanter	02
Cultivator	02
Weeder	01

Agricultural & Industrial Extension

- Conduct field demonstrations and awareness programs as per the requests made by extension officers and participating agricultural exhibitions.

STAFF LIST

Designation	No. Existing
Deputy Director	01
Mechanical Engineer	03
Agricultural Instructor	02
Public Management Assistant	02
Technological Assistant	09
Driver	03
Storeman	01
Mechanic	05
Machinist	03
Technician	05
Plant Yard Attendant	01
Carpenter	01
Office Employee	01
Watcher	03
Unskilled Laborer	26
Laborer (Contract)	02
Total	68

4.3 FINANCE DIVISION - PERADENIYA

The main objective of the finance division is to establish and operate a sound financial management system in the Department of Agriculture. The main activities of the Finance Division are,

- Preparation of annual revenue and expenditure estimates.
- Maintenance of Bank accounts.
- Allocation of Departmental and Ministry provisions.
- Collection and accounting of revenue of the Department.
- Make all recurrent and capital expenditure including personal emoluments.
- Performing internal audit activities.
- Preparation of financial progress reports and evaluation.
- Co – ordination of financial activities with local, and foreign, government and non-government Organizations
- Foreign payments.
- Implementation of farm advance account activities.
- Preparation of final accounts including appropriation and Revenue accounts.
- Conducting annual Board of Survey.
- Payment of loans to employees.
- Training of personnel on computer application and financial management.

PROGRESS

Recurrent Expenditure

Table 4.3.1: Recurrent expenditure - 2017

Project	Project Description	Revised Estimate (Rs.)	Expenditure (Rs.)	Progress (%)
285 - 1 - 1	Administration & Establishment Services - Domestic Fund	441,515,000	424,271,000	96
285 - 2 - 2	Agriculture Research & Development - Domestic Fund	1,613,957,000	1,447,688,000	90
285 - 2 - 3	Agriculture Extension & Training - Domestic Fund	1,255,420,000	1,197,589,000	95
285 - 2 - 4	Seed Certification & Plant Protection - Domestic Fund	1,261,722,000	1,180,111,000	94
Total		4,572,614,000	4,249,659,000	93

Capital Expenditure

Table 4.3.2: Capital expenditure - 2017

Project	Project Description	Revised Estimate (Rs.)	Expenditure (Rs.)	Progress (%)
285-1-1	Administration & Establishment Services - Domestic Fund	45,488,000	35,016,000	77
285-2-2	Agriculture Research & Development - Domestic Fund	289,370,000	189,155,000	65
	Agriculture Research & Development - Foreign Fund	117,029,000	93,529,000	80
285-3-3	Agriculture Extension & Training - Domestic Fund	373,600,000	293,689,000	79
285-4-4	Seed Certification & Plant Protection - Domestic Fund	964,600,000	816,692,000	85
Total - Domestic Fund		1,673,058,000	1,334,552,000	80
Total - Foreign Fund		117,029,000	93,529,000	80

Agriculture Ministry and Other Institutes

Table 4.3.3: Expenditure for other Ministries & Departments - 2017

Head	Name of the Institutes	Allocation (Rs.)	Expenditure (Rs.)
01	His Excellency the President	973,000	930,000
118	Ministry of Agriculture	1,352,586,000	847,847,000
119	Ministry of Power & Renewable Energy	14,300,000	17,000
160	Ministry of Mahaweli Development and Environment	103,000	81,000
194	Ministry of Telecommunication & Digital Infrastructure	10,000,000	60,000
Total		1,377,962,000	848,935,000

Provision under each project is underutilized as imprest is insufficient for making payments even if the bills were received. Bills in hand under each project are shown below.

Bills in hand under Recurrent payment

Table 4.3.4: Bills in hand under recurrent payment - 2017

Project	Project Description	Bills in hand (Rs.)
285 - 1 - 1	Administration & Establishment Services	263,000
285 - 2 - 2	Agriculture Research & Development	402,000
285 - 2 - 3	Agriculture Extension & Training	-
285 - 2 - 4	Seed Certification & Plant Protection	4,860,000
Total		5,525,000

Bills in hand under Capital payment

Table 4.3.5: Bills in hand under Capital payment - 2017

Project	Project Description	Bills in hand (Rs.)	
		Domestic	Foreign
285 - 1 - 1	Administration & Establishment Services	7,807,000	
285 - 2 - 2	Agriculture Research & Development	76,376,000	10,399,000
285 - 2 - 3	Agriculture Extension & Training	49,827,000	
285 - 2 - 4	Seed Certification & Plant Protection	44,535,000	
Total		178,545,000	10,399,000

Bills in hand under Agriculture Ministry and Other Institutes

Table 4.3.6: Bills in hand under Agriculture Ministry and other institutes - 2017

Head	Name of the Institutes	Bills in hand (Rs.)
118	Ministry of Agriculture	400,654,251
119	Ministry of Power & Renewable Energy	13,963,000
160	Ministry of Mahaweli Development and Environment	19,500
194	Ministry of Telecommunication & Digital Infrastructure	9,563,695
Total		424,200,446

Operation of Advance Account Activities (Debits)

Table 4.3.7: Operation of Advance Account Activities (Debits) - 2017

Description	Rs.
1. Maintenance of Agricultural Farms	
Total Debits	548,078,000
2. Public Officers Advance Account	
Total Debits	311,462,000
Grand total	859,540,000

Operation of Deposit Accounts Activities

Table 4.3.8: Operation of Deposit Accounts Activities (Debits & Credits) - 2017

Description	Rs.
Total Debits	593,174,000
Total Credits	627,120,000

Operation of Advance Account Activities (Credits) - 2017

Table 4.3.9: Operation of Advance Account Activities (Credits)

Description	Rs.
1. Maintenance of Agricultural Farms	
Total Credits	680,398,000
2. Public Officers Advance Account	
Total Credits	199,926,000
Grand total of Advance Accounts	880,324,000

Operation of Revenue Accounts during the year 2017 (Credits)

Table 4.3.10: Operation of Revenue Accounts during the year 2017 (Credits)

Revenue Heads	Category	Actual Receipts (Rs.)
20 - 02 - 02 - 99	Loan Interest	20,512,000
20 - 03 - 99 - 00	Other receipts	236,321,000
20 - 02 - 01 - 01	Rent and others	28,601,000
20 - 03 - 02 - 18	Department Sale & Other charges	290,700,000
20 - 04 - 01 - 00	W & O.P	140,853,000
20 - 06 - 02 - 00	Sale of capital assets	528,000
20 - 03 - 02 - 99	Sundries	159,000
20 - 03 - 03 - 02		575,000
Total Credits of Revenue		718,249,000

STAFF LIST

Designation	No. Existing
Chief Accountant	01
Deputy Director (Finance)	01
Chief Internal Auditor	01
Deputy Director (Finance)	03
Assistant Director (Finance)	07
Translator	01
Development Officer	39
Public Management Assistant	62
Driver	07
Office Employee	09
Unskilled Laborer	19
Total	150

4.4 PROGRESS MONITORING AND EVALUATION UNIT (PMEU) - PERADENIYA

The mandatory task of the Progress Monitoring and Evaluation Unit is to monitor and evaluate the activities and development programs of all institutes and centers of DOA and projects implemented by the Ministry of Agriculture through DOA. In addition to this, the responsibility for the preparation of Annual Action Plans, Procurement Plan, Annual Performance Report, monthly and quarterly progress reports and other relevant reports of the DOA for the Ministry of Agriculture and other institutes, also vests with this unit. Progress review meetings are convened by the PMEU in order to streamline the activities of

the DOA and it also attends the Progress review meetings conducted by the other institutes of DOA and the Ministry of Agriculture.

PMEU which was established in 1992, has now been relocated with necessary infrastructure at the head office premises and the building has been fully repaired by now. The Monitoring Cell functioning directly under Additional Director General (Development) as the coordinating body working on the progress of the National Food Production Program has been attached to this unit from 02nd May.

BUDGET

Table 4.4.1 depicts the allocation received and expenditure incurred by the Progress Monitoring and Evaluation Unit for the year 2017.

Table 4.4.1: Annual budget- 2017

Vote	Allocation (Rs.)	Expenditure (Rs. M.)	Expenditure (%)
Recurrent	1,291,485	1,246,652	97
Capital	601,441	597,333	99
Total	1,892,926	1,843,985	97

PROGRESS

Compilation of Action Plans

Action plans for the year 2017 were compiled under following categories.

- Recurrent expenditure
- Normal Capital expenditure
- Special projects implemented through the funds of the DOA
- Special projects funded through the Ministry of Agriculture (including the National Food Production Program)
- Technical program of the DOA (Technical Action plan depicted an incompleteness due to the fact that recurrent allocations were not distributed fully among the Divisions at the beginning of the year and they were retained by the Chief Accountant to be released in intervals)
- Procurement plan of the DOA

Supervision of Financial and Physical Progress

Physical and financial progress of capital, recurrent, special projects, National Food Production Program, National agricultural Research Plan, Small Scale projects and the Technical Action Plan have been monitored in the year 2017. Monthly progress reports of

other projects except the monthly progress reports of Recurrent, Capital expenditure and Technical Action Plan were prepared and submitted to the Ministry of Agriculture. In addition to this, progress reports of Recurrent, Capital expenditure were submitted monthly and progress reports of Technical Action Plan were submitted quarterly to the audit sections.

Table 4.4.2: Summary of progress of DOA during 2017

Vote	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
Recurrent	4,572.61	4,248.64	-	4,248.64	93
Capital	515.72	377.56	95.31	472.87	92
Projects under DOA votes	1,105.05	941.90	90.40	1,032.30	93
National Food Production Program	944.27	448.86	382.76	831.62	88
Projects under Ministry of Agriculture votes (except for National Food Production Program)	78.84	49.36	17.89	67.25	85
Total	7,216.49	6,066.32	586.36	6,652.68	92

Progress Monitoring of Special Projects

Special Projects under DOA votes

Progress of 18 special projects implemented under DOA votes was monitored and

monthly reports including physical and financial progress were submitted to the Director General of Agriculture. Financial progress of special projects under DOA votes is given in Table 4.4.3.

Table 4.4.3: Financial progress of special projects under DOA votes during 2017

Vote No.	Project Title	Institute	Allocation (Rs. Mn.)		Expenditure (Rs. Mn.) as per the report of the Director		Expenditure As per the Finance Branch (Rs. Mn.)		Expenditure as per the report of the Director (%)	
			Total	Per Institute	Total	Per Institute	Expenditure	Bills in hand	Total	Per Institute
285-02-02-8-2507	1. Development and production of seeds of open pollinated other field crop varieties and new hybrid Chilli, Maize, Onion and vegetable varieties	FCRDI	80	43	72.17	36.52	44.39	32.394	90	85
		HORDI		27.5		26.89				98
		FRDI		9.5		8.76				94
285-02-02-9-2507	2. Establishment of 100 Fruit Villages	FRDI	15	15	15	15	10.626	1.632	100	100
285-02-02-10-2507	3. Establishment of Bio - Diversity Garden of Tropical Fruits at the FRDI (Horana)	FRDI-Horana	25	14.5	20.1	13.82	16.234	4.671	80	95
		FRDI-Kundasale		10		5.49				55
		FRDI-Homagama		0.5		0.78				156

Vote No.	Project Title	Institute	Allocation (Rs. Mn.)		Expenditure (Rs. Mn.) as per the report of the Director		Expenditure As per the Finance Branch (Rs. Mn.)		Expenditure as per the report of the Director (%)	
			Total	Per Institute	Total	Per Institute	Expenditure	Bills in hand	Total	Per Institute
285-02-02-7-2507	4. Implementation of Soil Conservation Act	NRMC	5	5	5	5	3.68	1.888	100	100
285-02-02-0-2104 (03)	5. Establishment of Regional Agricultural Research and Development Center - Thirunelveli	FCRDI	6	6	6	6	3.3	2.7	100	100
285-02-03-8-2507	6. Development of Agriculture Schools	ETC	55	55	48.41	48.41	41.78	9.18	88	88
285-02-03-4-2507	7. Media Program	FBS	30	16	30.08	16.7	28.99	0.871	100.3	104
		PU		2.55		2.55				100
		A-Park		10		10				100
		NAICC		1.45		0.79				54

Vote No.	Project Title	Institute	Allocation (Rs. Mn.)		Expenditure (Rs. Mn.) as per the report of the Director		Expenditure As per the Finance Branch (Rs. Mn.)		Expenditure as per the report of the Director (%)	
			Total	Per Institute	Total	Per Institute	Expenditure	Bills in hand	Total	Per Institute
285-02-03-7-2507	8. Agro Technology Park	NAICC - Gannoruwa	5	2.5	5	2.5	4.92	0.189	100	100
		NAICC – Bata atha		2.5		2.5				100
285-02-03-6-2401	9. Annual Symposium of the DOA	NAICC	4	4	4	4	4.0	-	100	100
285-02-03-2-2105	10. Development associated lands of the farms of Agriculture Schools	ETC	15	13	15	12.95	12.52	3.53	100	99.6
		NAICC		2		2.05				102
285-02-04-1-2507	11. National seed production & purchasing program	SPMDC	498.02	498.02	494.2	494.2	455.97	-	99	99
285-02-04-5-2507	12. Accelerated seed farm development program	SPMDC	120	120	119.16	119.16	108.49	9.70	99	99
285-02-04-9-2507	13. Increasing local seed potato production	SPMDC	60	60	59.34	59.34	59.63	0.29	99	99

Vote No.	Project Title	Institute	Allocation (Rs. Mn.)		Expenditure (Rs. Mn.) as per the report of the Director		Expenditure As per the Finance Branch (Rs. Mn.)		Expenditure as per the report of the Director (%)	
			Total	Per Institute	Total	Per Institute	Expenditure	Bills in hand	Total	Per Institute
285-02-04-4-2507	14. Ensuring the quality of seed & planting material through the implementation of Seed Act	SCPPC	15	15	15	15	10.39	4.68	100	100
285-02-04-8-2507	15. Minimization of potential adverse effects of agrochemicals on human health and environment	SCPPC	5	5	5.05	5.05	2.91	0.87	101	101
285-02-02-5-2507	16. National Agricultural Research Plan	DOA	50	50	46	46	40.597	7.09	93	93
285-02-02-4-2507	17. Small scale Projects	DOA	60	60	46.4	46.4	36.5	10.7	77	77
285-02-02-12-2507	18. Post harvest management	FRU	57.03	57.03	57.03	57.03	57.03		100	100
Total				1,105.5		1,062.9	943.78	90.4	96	96

Table 4.4.4: Institute wise financial progress of National Agriculture Research projects during 2017

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
1	Improvement of grain quality attributes of rice varieties suitable for the international community	RRDI	0.743	0.532	72
2	Determination of phosphorus fertilizer requirement for rice based on soil phosphorus map of Sri Lanka	RRDI	1.45	1.400	97
3	Development of new Cytoplasmic Male Sterile lines (CMS)	RRDI	1.0003	0.98	98
4	Role of allelochemicals in rice (<i>Oryza sativa</i>) responsible for reproductive maturity of paddy bug, <i>Leptocorsia oratorius</i> (Hemiptera: Alydidae)	RRRDC, Bombuwala	0.2224	0.219	99
5	Establishment of an E-Pest surveillance and forecasting system to empower farmers in managing rice pests and diseases in Galle district	RRS, Labuduwa	0.5684	0.171	30
6	Development of rice varieties for salinity affected flood prone soil conditions of Low Country Wet Zone through farmer participatory approach.	RRS, Labuduwa	0.6206	0.5616	90
7	Development of new salinity tolerance rice lines to improve rice productivity under salinity affected areas in Sri Lanka	RRDI	1.3176	1.313	100
8	Development of Brown Plant Hopper (BPH) resistant new rice lines as eco-friendly approach for BPH management	RRDI	1.0352	0.970	94

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
9	Introgression of heat tolerance to mega rice varieties in Sri Lanka to develop new segregating populations for generation advancement	RRDI	1.6307	1.63	100
10	Investigation of patho type diversity of the bacterial leaf blight pathogen <i>Xanthomonas oryzae</i> pv. <i>oryzae</i> in Sri Lanka	RRDI	0.5741	0.393	68
11	Development of integrated management method for rice field rats based on their biology, ecology and behavior	RRDI	1.3580	1.001	74
12	Integrated weed management approach in direct seeded rice to reduce the herbicide dependency and yield losses due to weeds in Hambantota District	RRS, Ambalanthota	0.3551	0.3331	94
13	Development of rice varieties for abiotic stresses tolerant, submergence, salinity, drought escape/ tolerance and iron toxicity	RRDI	1.2725	1.271	100
14	Evaluation of morphophysiological responses and the level of tolerance of some selected rice varieties to iron toxicity in Low Country Wet Zone	RRRDC, Bombuwala	0.493	0.379	77
15	Development of Mung bean varieties with Mung bean yellow mosaic virus and bruchid resistance.	FCRDI	1.42	1.34	94
16	Collection, establishment and evaluation of wood apple germplasm from Dry and Intermediate Zones.	FCRDI GLORDC	2.6945	2.578	96

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
17	Identification of virus and virus like diseases in Chilli, legumes and Cucurbits in Southern Dry Zone region in Sri Lanka	FCRDI GLORDC	1.2050	1.194	99
18		PVIC	1.0	0.800	80
19	Development of technological packages for the sustainability of small millets in rain-fed farming systems of Dry Zone in Sri Lanka.	FCRDI GLORDC	0.2465	0.2247	91
20	Development of dual purpose cluster onion varieties to fulfill the needs of planting materials and commercial bulb requirement in Sri Lanka	RARDC, Kilinochchi	3.2060	2.905	91
21	Causes for low adoption rates of micro irrigation in Jaffna and Vavuniya districts and mitigation measures	FCRDI ARS, Thirunelvely	0.2655	0.134	50
22	Identification of onion black mold complex and its biological control using <i>Trichoderma</i> spp.	FCRDI	0.5317	0.5317	100
23	Identification of Bio-types of Brown Plant Hopper (<i>Nilaparvata lugens</i>) in Sri Lanka	FCRDI	0.7733	0.760	98
24	Bitter gourd variety improvement with incorporating economically important traits using bio technological tools	HORDI	0.5805	0.500	86
25	Management of <i>Botrytis</i> blight of Lettuce and Tomato in poly tunnels by cultural practices, biological control agents and safe chemicals	HORDI	0.5838	0.552	95

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
26	Diversity of <i>Ralstonia solanacearum</i> species complex causing bacterial wilt in Solanaceous vegetable crops in Sri Lanka	HORDI	0.8982	0.909	101
27	Studies on morphological & biochemical parameters of Brinjal genotypes for resistant/ tolerant against Brinjal Shoot and Fruit Borer (BSFB) (<i>Leucinodes</i>)	HORDI	0.4835	0.441	91
28	Development of novel floriculture varieties through physical mutagenesis	HORDI	0.2952	0.299	101
29	Isolation and mass culturing of effective and efficient antagonistic bacteria for the control of major root-knot-nematodes (<i>Meloidogyne</i> spp.)	HORDI	1.3011	1.1621	89
30	Monitoring of insecticide resistance status in mites/ thrips in order to implement effective insect pest management programs for vegetables	HORDI	0.5309	0.5259	99
31	Development of inbred lines in Bell pepper through bio technological breeding techniques	RARDC, Bandarawela	0.2302	0.219	95
32	Development of rust resistance bean varieties, through conventional and molecular breeding techniques.	RARDC, Bandarawela	0.474	0.37	78
33	Development of new and rapid alternative techniques for heat and drought screening of Tomato	RARDC, Bandarawela	0.2926	0.27	92
34	Development of local Gerbera varieties with high commercial value using conventional and molecular breeding techniques.	RARDC, Bandarawela	0.3115	0.2924	94

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
35	Development of <i>Metarhizium anisopliae</i> as a bio pesticide to manage shoot and fruit borer <i>Leucinodes orbonalis</i> (Guen.) in Brinjal (<i>Solanum melongena</i> L.)	RARDC, Makandura	0.2729	0.2689	99
36	Development of Okra breeding lines having resistance/ tolerance to yellow vein mosaic virus with comparable yield	RARDC, Makandura	0.6068	0.574	95
37	<i>In vitro</i> mutagenesis of Banana for <i>Fusarium</i> wilt (<i>Fusarium oxysporum</i> f.sp. <i>cubense</i> (Foc)) resistance/tolerance	ARS, Thelijawila	0.18	0.179	99
38	Development of high yielding, high quality 'Innala' variety (<i>Solenostemon rotundifolius</i>) for Sri Lanka	ARS, Thelijawila	0.7178	0.681	95
39	Present status and future implications of floriculture sector in Matara district	ARS, Thelijawila	0.4455	0.449	101
40	Conservation and characterization of selected fruit germplasm using molecular methods for establishment of bio diversity garden of tropical fruits at Girandurukotte	ARS, Girandurukotte	1.2744	1.231	97
41	Identification and confirmation of phytoplasma disease and their host range in cultivated crops	FRDI PVIC	1.5183	1.5676	103
42	Development of promising Pomegranate lines through <i>in vitro</i> mutation induction	FRDI PVIC	0.3279	0.274	84

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
43	Optimization of micro propagation protocol for DOA recommended Banana variety “Agra”	FRDI PVIC	0.2844	0.2697	95
44	Development of a protocol for trunk injection of pesticides as a part of an integrated pest management	FRDI PVIC	0.5955	0.4588	77
45	Potential use of soil antagonisms for successful management of Panama diseases of Banana caused by <i>Fusarium oxysporum</i> f. sp.	FRDI PVIC	1.6717	1.5982	96
46	Development of technologies for the production for virus free planting material through propagation techniques for selected fruit crops.	FRDI PVIC	0.8464	1.057	125
47	Development of Passion fruit varieties through hybridization and varietal selection	FRDI	0.8928	0.8289	93
48	Regulation of fruit set and postharvest life and investigation of variability bioactive compounds in edible <i>A. muricata</i> accessions found in Sri Lanka	FRDI	1.17	1.0050	86
49	Improvement of yield and quality of banana (<i>Musa</i> spp.) Var. Millewa Suwandel by some management practices	FRDI	1.2916	1.2353	96
50	Characterization of flowering behavior and floral biology of Beli, Wax apple, Ceylon olive, Soursop and Sapodilla for improvement of productivity and quality.	FRDI	1.3685	1.3970	102

No.	Project Title	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
51	Establishment of Avocado gene bank for selection of high yielding, good quality varieties	FRDI	0.3912	0.3600	92
52	Development of high yielding good quality Citrus (Sweet orange and Mandarin) varieties (Hybrid development).	FRDI	1.6560	1.5848	96
53	Management of root diseases of perennial fruit trees through integrated approaches	FRDI	0.100	0.0994	99
54	Assessment of soil erosion status in different land uses in low country dry and intermediate zones in North Western Province of Sri Lanka using nuclear techniques	NRMC	0.225	0.21	93
55	Assessment of existing fertigation protocols with respect to their marketable yield in different agro-ecological regions	ETC	0.2384	0.238	100
56	Development of sustainable nutrient management for vegetable cultivation	ETC	0.8	0.786	98
57	<i>Dioscorea</i> micro tuberization as a tool for long term conservation and planting material production	SCPPC	0.6393	0.610	95
58	Development of standards for Vapormate and liquid phosphine for quarantine and non-quarantine fumigation of agricultural commodities	SCPPC	2.3550	2.334	99
Total			50	46	93

Table 4.4.5: Financial progress of Small Scale projects during 2017

No.	Vote	Project Name	Institute	Funding Agency	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
1	285-2-2-4-2507	Green Super Rice.	RRDI	IRRI	2.161	2.159	100
2	285-2-2-4-2507	Closing rice yield gaps in Asia.	RRDI	IRRI	4.0	3.732	93
3	285-2-2-4-2507	Management of weeds and weedy rice in direct seeded rice in Sri Lanka	RRDI	IRRI	0.248	0.248	100
4	285-2-2-4-2507	Establishment of model rice farming village for high quality and productivity in Sri Lanka.	RRDI	KOPIA	9.053	4.92	54
5	285-2-2-4-2507	Increase in the productivity of Mung bean in Sri Lanka.	FCRDI	KOPIA	4.8	4.31	90
6	285-2-2-4-2507	Seed multiplication and cropping technology development for Onion varieties in Sri Lanka	FCRDI	KOPIA	10.884	4.25	39
7	285-2-2-4-2507	Productivity enhancement of edible mushroom in Sri Lanka	HORDI - Gannoruwa	KOPIA	0.8	0.8	100
			HORDI - Seetha Eliya		0.1	0.1	100
			HORDI - Thelijjawila		0.1	0.096	96
			HORDI - Makandura		2.676	2.6	97

No.	Vote	Project Name	Institute	Funding Agency	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
8	285-2-2-4-2507	Integrated management of plant genetic resources.	HORDI	AFACI	3.5	2.980	85
9	285-2-2-4-2507	Asian Net Work for Sustainable Organic Farming.	HORDI	AFACI	1.761	1.663	94
10	285-2-2-4-2507	Technology dissemination of virus -free seed potato production using hydroponic production systems.	HORDI	AFACI	2.7	2.7	100
11	285-2-2-4-2507	Production of postharvest manuals and application of manuals	HORDI / FRU	AFACI	2.232	2.23	100
12	285-2-2-4-2507	Development and locally appropriate GAP program and agriculture produce safety information system in Sri Lanka	ETC	AFACI	1.60	0.900	56
13	285-2-2-4-2507	Agriculture Technology Information Network (ATIN)	NAICC	AFACI	6.335	6.3	99
14	285-2-2-4-2507	Construction of epidemiology information interchange system for migratory disease and insect pests in Asia Region	SCPPC	AFACI	4.832	4.77	99

No.	Vote	Project Name	Institute	Funding Agency	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
15	285-2-2-4-2507	Demonstration project to distribute national superior seeds of food crops and transfer agriculture technology	SPMDC	AFACI	2.1	2.05	98
Total					60.0	46.8	78.0

Table 4.4.6: Thrust area wise financial progress of the National Food Production program under Ministry votes during 2017

Vote	Project	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
118-02-03-20-2509	Crop Production Program	429.21	369.35	86
	Special Projects	166.1	142.14	86
	Input Management	77.14	76.37	99
	Participation of Young Women	62.8	45.60	73
	Consumer Satisfaction	27.8	23.776	85
	Management of Natural Resources	22.1	18.53	84
	Research Program	17.63	16.27	92
	Food Safety	141.5	136.59	97
Total		944.27	828.62	88

Table 4.4.7: Financial progress of projects under National Food Production program during 2017

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
1	Increasing production and productivity of Paddy	ETC	13.390	13.037	97	9.578	5.126	14.704	110
2	Increasing production and productivity of Maize	ETC	57.707	57.686	100	25.967	31.579	57.546	100
3	Increasing production and productivity of Big Onion	ETC	4.530	3.450	76	3.450	0.453	3.904	86
4	Increasing production and productivity of Chilli	ETC	16.320	14.395	88	10.598	3.890	14.488	89
5	Increasing production and productivity of Soya	ETC	79.320	77.108	97	76.840	1.124	77.964	98
6	Increasing production and productivity of Green Gram	ETC	2.780	2.340	84	2.201	0.040	2.241	81
7	Increasing production and productivity of Potato	HORDI	241.664	190.585	79	69.027	120.075	189.102	78
8	Seed Potato production	UP	13.500	10.751	80	10.751	0.000	10.751	80

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
9	Distribution of agricultural plant & machinery to agricultural organization	NAICC	3.361	3.359	100	3.359	0.000	3.359	100
10	Increase availability of seed & planting material	SPMDC	22.917	22.796	99	18.598	4.198	22.796	99
11	Farm mechanization under input management	Eng. Division	50.859	50.216	99	11.087	38.996	50.083	98
12	Women empowerment and increase availability of local nutritional food through 'Hela Bojun'	ETC	57.000	41.330	73	29.288	14.852	44.139	77
13	Commercial farming & agri business development	ETC	5.800	4.267	74	0.248	3.749	3.996	69
14	Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local and export markets through Good Agriculture Practices (GAP) -2017	ETC	27.800	23.765	85	9.332	9.730	19.063	69

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
15	GIS mapping for progress mapping	NRMC	2.000	1.277	64	1.228	0.046	1.273	64
16	Recommendation of crops for different agro ecological regions	NRMC	0.100	0.095	95	0.092	0.007	0.099	99
17	Establishment of sustainable land management strategies	NRMC	5.400	4.160	77	4.312	0.036	4.348	81
18	Implementation of soil conservation interventions	NRMC	10.0	8.805	88	7.896	0.868	8.763	88
19	Soil and water security through implementation of conservation strategies	NRMC	2.5	2.388	96	2.370	0.495	2.865	115
20	Long-term climate forecasting and introduction & promotion of crop cultivation based on climatic predictions	NRMC	1.100	0.826	75	0.395	0.334	0.730	66

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
21	Characterization and on farm conservation of traditional rice varieties	PGRC	1.000	0.978	98	0.751	0.215	0.966	97
22	Productivity improvement of rice	RRDI	3.6	3.580	99	2.880	0.062	2.943	82
23	Technological interventions to improve production and productivity of selected vegetables	HORDI	1.0	0.638	64	0.458	0.180	0.638	64
24	Development of Bio-intensive Integrated Pest and disease Management (BIPM)	HORDI	3.0	2.906	97	2.426	0.559	2.985	99
25	Enhancement of the productivity of fruit crops by managing major pest problems	FRDI	0.375	0.337	90	0.263	0.073	0.336	90
26	Development of <i>in vitro</i> techniques for healthy planting material production of mandarin	FRDI	0.7	0.687	98	0.577	0.110	0.687	98

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
27	Development of a package to minimize post harvest losses of selected fruit crops	FRDI	1.3	0.702	54	0.483	0.379	0.862	66
28	Development of control measures of commonly found post harvest fruit rot diseases of Avocado and Annona	FRDI	0.5	0.452	90	0.129	0.311	0.440	88
29	Study the behavioral changes of reproductive and productivity parameters of major fruit crops under a changing and variable climate in different agro ecological regions in Sri Lanka	FRDI	1.0	0.970	97	0.431	0.539	0.970	97
30	Technological intervention to improve production and productivity of selected fruits (Citrus)	FRDI	0.2	0.198	99	0.198	0.000	0.198	99

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
31	Technological intervention to improve production and productivity of selected fruits (Strawberry)	FRDI	0.2	0.199	100	0.184	0.016	0.200	100
32	Productivity enhancement of Chilli	FCRDI	1.0	0.984	98	0.921	0.063	0.984	98
33	Productivity enhancement of Black gram	FCRDI	0.25	0.238	95	0.153	0.085	0.238	95
34	Enhancement of OFC & fruit during off season & non-conventional measure to climate change	NRMC	0.5	0.394	79	0.146	0.267	0.412	82
35	Development of suitable seed film coating technique to increase the storage life of vegetable seeds	SCPPC	4.0	3.981	100	0.982	3.650	4.632	116
36	Promotion of integrated pest management for agriculture	SCPPC - PPS	1.800	1.465	81	1.440	0.039	1.478	82

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
37	Mass rearing of biological insect pest control agents for the control of Cabbage & Tomato pests (Preliminary step for establishment of insect pest control infirmary in Sri Lanka)	SCPPC - PQU Gannoru wa	4.000	3.946	99	0.483	3.657	4.140	103
38	Development of Gamma radiation treatment standards to control fruit fly spp. (<i>Bactrocera dorsalis</i>) of export potential fruit of Sri Lanka	SCPPC - Plant Quaranti ne Station Seaport	3.700	3.628	98	1.904	1.908	3.812	103
39	Application of good agriculture practices (GAP) for the export fresh fruits, vegetables, ornamental plant sector and coir products	SCPPC - NPQS	10.000	7.702	77	2.300	5.568	7.868	79

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
40	Efficient plant quarantine services provided to the importers, exporters and other agriculture stakeholders for the economic development	SCPPC - NPQS	12.000	11.409	95	1.145	10.313	11.458	95
41	Establishing a National Pesticide Residue Monitoring program for fresh fruits & vegetables to strengthen national food economy & safety	SCPPC - ROP	10.000	9.870	99	5.873	4.043	9.917	99
42	Soil test based fertilizer recommendations for GS divisions and efficient fertilizer management	HORDI	100.000	98.571	99	13.090	85.690	98.780	99
43	Bee keeping production program	ETC	15.000	11.196	75	7.519	3.767	11.287	75
44	Sweet potato and Cassava cultivation to overcome food shortage in the country due to prevailing drought	HORDI	2.395	2.209	92	1.735	0.456	2.191	91
45	'Thirasara Yugayak' National exhibition	NAICC	1.860	0.965	52	1.086	0.004	1.090	59

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
46	Establishment of soil microbiology Laboratory at the Center for Excellence in Organic Agriculture, Makandura	ETC	16.000	7.533	47	5.018	2.620	7.637	48
47	Design the school garden of Vishaka Vidyalaya, Colombo	NAICC	0.990	0.844	85	0.948	0.000	0.948	96
48	For the program of preparing a procedure to assure the food security after assessing the effects of recently experienced drought	ETC	0.356	0.236	66	0.236	0.000	0.236	66
49	Training of two year Diploma holding Agriculture Research Assistants on landscaping	NAICC	0.103	0.103	100	0.103	0.000	0.103	100
50	Fruit villages program - Providing 2100 plants for Rathgama development Foundation	SPMDC	0.525	0.475	90	0.475	0.000	0.475	90

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
51	Fruit villages program - Providing fruit plants for 'Yowun Puraya' program	SPMDC	0.214	0.201	94	0.201	0.000	0.201	94
52	Fruit villages program -Providing 1000 Fruit plants for 700 Temples	SPMDC	0.172	0.163	95	0.163	0.000	0.163	95
53	'Jathika Wap Magul Ulela' - Construction of stage	NAICC	0.810	0.804	99	0.781	0.025	0.806	100
54	Giving of seed paddy for damaged paddy lands	SPMDC	49.811	49.811	100	49.811	0.000	49.811	100
55	'Jathika Wap Magul Ulela' - Engineering Division	Eng. Division	0.320	0.340	106	0.249	0.073	0.322	101
56	Supplying seeds for home garden program	SPMDC	34.5	30.477	88	27.954	4.022	31.976	93
57	Strengthening of the Monitoring activities of Food production National Program	PMEU	1.05	1.047	100	0.740	0.306	1.047	100

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
58	Tom EJC mango plantation at Iranamadu Camp of the Sri Lanka Air Force	SPMDC	0.25	0.250	100	0.250	0.000	0.250	100
59	Establishment of e-Agriculture	NAICC, PMEU, SCPPC, Admin. Div.	19.49	17.377	89	0.000	16.820	16.820	86
60	Using paddy transplanters for 'Waga Sangramaya' (National food production campaign) in the Maha season 2017/18	ETC	4.3	0.259	6	0.000	0.964	0.964	22
61	Obtaining 100,000 fruit plants for cultivation in school premises	SPMDC	10.023	10.023	100	10.023	0.000	10.023	100
62	Printing of invitation cards & posters for National Food Production Campaign - 2017	NAICC	0.179	0.146	82	0.000	0.183	0.183	102

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
63	Providing 10,500 packets of seed for 'Ekwemu nagitimu atukotu purawamu' program	SPMDC	0.635	0.635	100	0.635	0.000	0.635	100
64	Stage decorations and overtime payment for the inaugural ceremony of Activity plan of the Ministry of Agriculture	NAICC	0.0166	0.017	100	0.000	0.017	0.017	100
65	Establishment of a home garden at the quarters premises of the Minister of Agriculture	NAICC	0.2	0.182	91	0.000	0.182	0.182	91
66	Promotion of home gardening in 'Sevana' model villages	SPMDC	0.436	0.436	100	0.436	0.000	0.436	100
67	Fruit village program	SPMDC	5.567	5.567	100	5.567	0.000	5.567	100

No.	Project Title	Institute	Allocation (Rs. Mn.)	As per Director		As per Finance Division			
				Expenditure (Rs. Mn.)	Expenditure (%)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)	Total Expenditure (Rs. Mn.)	Expenditure (%)
68	Providing home garden seed packs for 14,022 Grama Niladhari divisions	SPMDC	0.848331	0.848	100	0.848	0.000	0.848	100
69	Purchasing of agriculture publication packages	NAICC	0.045	0.000	0	0.000	0.000	0.000	0
Total			944.268	828.616	88	448.612	382.762	831.374	88

Special Projects under Ministry votes

DOA received allocations from Ministry of Agriculture for different projects. The financial progress of those projects is given in Tables 4.4.7 and 4.4.8.

Table 4.4.8: Financial progress of special projects under Ministry votes during 2017

Vote	Project	Institute	Allocation (Rs. Mn.)		Expenditure as per the vouchers submitted (Rs. Mn.)	Expenditure as per the Finance Division (Rs. Mn.)	Expenditure (%)
			Total	Per Institute			
118-01-01-1409	Printing of Invitation Cards	NAICC	0.14	0.14	0.14	0.14	100
118-02-03-1409	Printing of Annual Performance Reports	NAICC	0.61	0.61	0.5	0.5	82

Vote	Project	Institute	Allocation (Rs. Mn.)		Expenditure as per the vouchers submitted (Rs. Mn.)	Expenditure as per the Finance Division (Rs. Mn.)	Expenditure (%)
			Total	Per Institute			
118-02-03-21-2509	Promotion of the use of Compost Products	CEOA - Makandura	19	15.5	12.29	12.29	79
		NAICC		3.5	3.02	3.02	86
118-02-03-31-2509	Skill Development Program	ETC	59.09	59.09	51.295	33.08	87
Total				78.84	67.25	49.03	85

Table 4.4.9: Financial progress of other projects during 2017

No.	Vote	Project Name	Institute	Funding Agency	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
01	194-2-3-11-2106	Implementation of Generic ePhyto National System (GeNS) in Sri Lanka	SCPPC	Consolidated Fund	10.5	9.55	91

HORDI - Horticultural Crop Research and Development Institute
NRMC - Natural Resources Management Centre
NAICC - National Agriculture Information and Communication Centre
SCPPC - Seed Certification and Plant Protection Centre
RARDC - Regional Agricultural Research and Development Centre

FRDI - Fruit Research and Development Institute
ETC - Extension and Training Centre
SPMDC - Seeds and Planting Materials Development Centre
PU - Publication Unit

Annual Performance Report

Annual Performance Report of the DOA for the year 2016 was prepared and submitted to the Parliament through the Ministry of Agriculture. Further, it was distributed to relevant Ministries, Universities, Libraries and other relevant institutions.

Other Reports

Progress reports of projects of which the total estimated cost exceeds Rs. 50 million were prepared and submitted to the Ministry of Agriculture.

Human Resources Availability

Head of the institution of this Unit, Deputy Director Mr. P.C. Peiris was promoted to the post of Additional Director.

Mrs. Nisansala Sandamali (Development Officer) was transferred from the Department of Agriculture.

During the year 2017, Mrs. S.A.N.D. Wijekoon (Translator - English/ Sinhala), Mr. R.M.S.M. Abeyrathne (Technological Assistant) and Mr. M.M.N.D. Bandara (Contract Labourer) assumed duties at the PMEU. In addition to this, due to the integration of the monitoring cell of the

National Food Production Program, Mrs. S.G. Dombagolla (Assistant Director of Agriculture - Development) Ms. Dilhani Perera (Public Management Assistant), Mrs. P.T.D.S. Perera, Ms. I.A.N Wijethilake, Miss. A.K.B. Ayomi, Mrs. L.M. Gunawardhana (Development Officer), Mrs. P.R.A Mahipali (Agriculture Instructor), Mr. W.G.M.S. Wijebandara (Labourer) were attached to this unit.

PLAN FOR 2018

- Preparation of Action plans, Procurement plans for special projects and Capital expenditure of the DOA.
- Preparation of progress reports of Capital and Recurrent expenditure of the DOA.
- Preparation of progress reports of special projects implemented under DOA and Ministry votes.
- Compilation and publishing of Annual Performance Report of the DOA.
- Preparation of reports on achievements of the DOA for the Performance report of the Ministry of Agriculture, Annual report of the Central Bank and for the parliamentary budget speech.
- Preparation of Technical Action Plan of the DOA and reporting progress.

STAFF LIST

Designation	No. Approved	No. Existing
Additional Director	01	01
Deputy Director of Agriculture	02	-
Assistant Director (Agriculture Development)	02	01
Assistant Director (Agriculture Economics)	01	-
Economist Assistant	01	-
Translator (English-Sinhala)	02	03

Designation	No. Approved	No. Existing
Translator (English-Tamil)	01	01
Program Assistant (Agriculture)	06	01
Development Officer	05	10
Agriculture Instructor	02	02
Public Management Assistant	02	02
Technological Assistant (Extension)	02	03
Driver	03	03
Office Employee	01	01
Laborer	03	03
Laborer (Contract)	02	02
Total	36	33

5. WEATHER REPORT

Meteorological data collected from 13 agro-meteorological stations representing different agro-ecological regions in Sri Lanka during 2016/2017 Maha (September – February) and 2017 Yala (March – August) seasons have been summarized in this report. This report has been compiled by the Agro-climatology and Climate Change Division, Natural Resources Management Center (NRMC) of the Department of Agriculture.

The cumulative rainfall of both seasons and their corresponding 10-year averages pertaining to 13 agro-meteorological stations are given in the Table 5.1 while Table 5.2 and 5.3 depicts monthly rainfall for the period of September 2016 to August 2017 and monthly 10-year averages of rainfall, respectively. Monthly mean values of other important agro-meteorological parameters, namely, potential evapotranspiration (estimated from open pan evaporation), temperature, relative humidity, bright sunshine hours and wind velocity are given in Tables 5.4, 5.5, 5.6, 5.7 and 5.8, respectively.

In general, rainfall of 2016/2017 Maha season was below the expectations in almost all regions of the country. First four months of the season have shown a substantial reduction of rainfall in all over the country. This negative anomaly could be probably attributed to the *La Nina* type circulation prevailed in the Central Eastern Pacific region during the same period. However, at the end of the Maha season considerably higher rainfall was received throughout the country due to series of atmospheric disturbances formed in the Bay of Bengal. Nevertheless, it was hardly sufficient to meet the water requirement of the late

planted crops in the field as February was unusually drier compared to a normal year.

Meanwhile, rainfall of 2017 Yala season was also not conducive for a successful agricultural production due to poor intermonsoonal weather conditions prevailed in the months of March and April, followed by weak southwest monsoonal circulation in the vicinity of Sri Lanka. cursory examinations of weather records reveal that rainfall of Yala season has not performed at its usual rhythm for the second consecutive time in a row. However, during May, heavy rains were experienced throughout the island within a few days of the month resulting severe natural disasters, both landslides and floods. Ratnapura, Galle, Gampaha, Hambantota, Matara, Kalutara and Kegalle districts were highly affected by these disasters with human casualties and greater crop losses. It also uncovers a situation of signaling climate change is already taking its share from the southwest monsoon, the rainy season which was used to be the country's most reliable rainy season.

Low Country Wet Zone

Bombuwela (WL_{1b})

There was a 33 percent reduction of cumulative seasonal rainfall of WL_{1b} region during 2016/2017 Maha season compared to its long term average of 1,501 mm. The recorded negative anomaly is mainly due to the reduction of rainfall during each month of the season except January compared to its long term average. However, cumulative potential evapotranspiration values were remained well below the cumulative rainfall of each month

except September and February thus; there was no threat of developing soil moisture stress conditions in upland crops grown in this region.

Compared to its long-term average of 1,655 mm, the seasonal cumulative rainfall of 2017 Yala season was also a 34 percent decrease. During each month of the season, a reduction of rainfall was observed compared to their respective long term averages. Nevertheless, monthly cumulative potential evapotranspiration values were remained below the cumulative rainfall of respective months and, thus there was hardly any chance of developing soil moisture stress conditions in upland crops grown in the region.

Mid Country Wet Zone

Peradeniya (WM_{2b})

Cumulative seasonal rainfall of 2016/2017 Maha season in this region was only about 467 mm, which is about 70 per cent decrease compared to the long-term average. This negative anomaly of rainfall is a result of below normal rainfall received in each month of the season except in January. The aforesaid negative anomaly was mainly attributed to the below normal rainfall experienced during the Second Inter Monsoon (SIM) season (October and November) and in the month of December. The decrease of cumulative monthly rainfall in December was about 85 percent compared to the long term monthly average. This period of the year usually receives rains due to the formation of weather systems in the Bay of Bengal under the influence of Inter Tropical Convergence Zone (ITCZ). But, activity of ITCZ in the current season was substantially weak resulting below normal rains from

October through December, the period usually known as the “Stormy Season” of the island. However, rainfall during January in this region was unusually wetter with 33 percent increase of monthly cumulative rainfall compared to its long term average. However, February and first half of the month March experienced usual dry weather conditions, setting right environmental conditions for flower primordia initiation in fruit crops grown in the region.

In this region, the cumulative Yala season rainfall in 2017 was 976 mm, which was only a three percent increase compared to its long term average. Three months of the season, namely March, May and August received above normal rains and the rest of three months received below normal rains compared to the long term monthly average. Monthly cumulative rainfall in April was not sufficient even to meet the evaporative demand of the atmosphere, an unusual situation compared to a normal Yala season.

Up Country Wet Zone

Sita Eliya (WU₃)

Cumulative seasonal rainfall of 2016/2017 Maha season in this region was about 610 mm, which was about 50 percent reduction compared to its long-term average. This decrease was mainly attributed to below normal rains experienced during the first four months of the season. Nevertheless, monthly cumulative potential evapotranspiration values were remained below the cumulative rainfall of respective months and in fact it may have even favored the conventional vegetable cultivation of this region with relatively lesser disease infestation and post-harvest losses. The maximum temperature during the season was

ranged from 15.4 °C to 23.0 °C while the minimum temperature was in the range of 5.8 °C to 17.8 °C with potential frost damages in crops grown in valley bottoms in this region during late mid January up to early February.

Rainfall during the 2017 Yala season was below normal in this region, which was about 19 percent reduction compared to the long-term average of 821 mm. and this was mainly due to the below normal rains received during each month of the season except March and August. Cumulative potential evapotranspiration during April and July exceeded the total receipt of rainfall during the same period. However, below average rainfall during the season may have even favored the vegetable cultivation in the area. The maximum temperature during the season was ranged from 14.8 °C to 24.8 °C while the minimum temperature was in the range of 6.4 °C to 15.0 °C.

Low Country Intermediate Zone

Batalagoda (IL_{1a})

The recorded cumulative seasonal rainfall of 636 mm during 2016/2017 Maha season in this region was a 47 percent decrease compared to its long-term average. This significant negative anomaly of Maha season's rainfall was a result of weak intermonsoonal conditions and, non occurrence of Weather Systems in the Bay of Bengal. Only January and February in the active growing season managed to receive the expected amount of rains due to disturbances in the Bay of Bengal. This situation led to result in low water levels in the minor irrigation tanks in the region with subsequent reduction in extent under paddy cultivation and upland crop production in this region.

The recorded cumulative seasonal rainfall of 830 mm in 2017 Yala season was just a three percent increase compared to its long-term average. This positive anomaly was mainly attributed to the considerable amount of rainfall received during pre-monsoonal disturbances in mid May prior to the onset of South West Monsoon (SWM). During the months of March and June, the cumulative monthly rainfall values were also above the long term average. It was in excess of cumulative potential evapotranspiration in each month of the season except in July and August.

Monaragala (IL_{1c})

Similar to the IL_{1a} region, this region experienced a 47 percent decrease in the cumulative seasonal rainfall of 2016/2017 Maha season over its long term average of 1,277 mm. This is mainly due to the below normal rains during the entire season except January. However, the potential evapotranspiration remained well below the rainfall during each month of the season, assuring a favorable soil moisture conditions for rainfed upland crops.

The cumulative seasonal rainfall of the 2017 Yala season in this region was 690 mm, which was about 7 percent increase compared to its long-term average. This increase was mainly attributed to the above normal rains experienced in each month of the season except April and June. Meanwhile, cumulative potential evapotranspiration was in excess of the rainfall in June and August. However, it cannot be considered as an unusual weather condition for the region as this region hardly experience well distributed rainfall throughout the Yala season.

Mid Country Intermediate Zone

Kundasale (IM_{3a})

The cumulative rainfall of 2016/2017 Maha season was about 60 percent decrease compared to its long-term average of 1,065 mm. Recorded negative anomaly was mainly attributed to the below normal rainfall received during each month of the entire Maha season. In addition, potential evapotranspiration values recorded were also above the cumulative monthly rainfall in this region except in November and January. Thus, despite being the major growing season for the region, crop damages due to soil moisture stress would have been possible where supplementary irrigation was not available.

The recorded cumulative seasonal rainfall in 2017 Yala season of 404 mm was about 30 percent decrease compared to its long-term average. Therefore, it may not have been possible to raise a successful rainfed upland crop in this region without supplementary irrigation.

Up Country Intermediate Zone

Bandarawela (IU_{3c})

This region experienced a below normal seasonal rainfall during 2016/2017 Maha season with a quantum of 549 mm. This 53 percent negative anomaly was mainly due to the below normal rainfall experienced during each month of the season except November and January. However, the potential evapotranspiration values were remained well below the cumulative rainfall during November, January and February. The maximum temperature during the season was ranged from 20.1 °C to 31.0 °C while the

minimum temperature was in the range of 8.0 °C to 20.8 °C.

Cumulative rainfall of 2017 Yala season was about 34 percent decrease over its long-term average of 959 mm. Rainfall during April to July were not up to the expectation and the decrease of cumulative monthly rainfall in April was about 84 percent compared to its long term average, a rare phenomenon to experience. Potential evapotranspiration values were well below the rainfall receipt during the season except in June and July. The maximum temperature during the season was ranged from 20.0 °C to 30.5 °C while the minimum temperature was in the range of 9.1 °C to 19.3 °C.

Dry Zone

Mahalluppallama (DL_{1b})

The cumulative Maha season rainfall in the north-central part of the DL_{1b} agro-ecological region was about 600 mm, a value which is 45 percent below the expected amount. This substantial decrease was mainly attributed to the negative anomaly of rains during each month of the season except January. Potential evapotranspiration values were remained well below the monthly rainfall during three months of the season, namely, in October, November and January.

A 51 percent increase in cumulative seasonal rainfall of 2017 Yala season was observed in this region compared to its long term average of 434 mm. This considerable increase was mainly attributed to the positive anomaly of rains during each month of the season except April. The heavy rainfall received during few days in mid May led to 328 percent increase of the cumulative monthly rainfall compared to

the long term average. Cumulative potential evapotranspiration values in all months of the season were in excess of the rainfall receipt except in March and May with potential soil moisture stress conditions in rainfed upland cultivations.

Angunakolapelessa (DL_{1b})

The decrease of the cumulative seasonal rainfall of 2016/2017 Maha season in the southern part of the DL_{1b} agro-ecological region was about 20 per cent compared to its long term average of 860 mm. The deficit was mainly attributed to the below normal rainfall experienced during each month of the season except January as in the case of its counterpart in the North Central province. Except at the beginning and the tail end of the season, the cumulative monthly potential evapotranspiration of the current season was remained below the monthly rainfall. Thus, despite being the major rainy season, development of some degree of soil moisture stress conditions in crops grown on well drained upland soils may have been occurred.

The cumulative Yala season rainfall of 2017 in this region was almost equal to its long term average, receiving 455 mm of rainfall which is just a three percent reduction compared to long term average. During this season, monthly cumulative rainfall catch of each month was below the expected amounts except in the month of May. Moreover, the potential evapotranspiration values were above the monthly rainfall during each month of the season except in few days of May. Hence, rainfed upland crops may have suffered from soil moisture stress conditions during their maturity phase unless supplementary irrigation was supplied.

Aralaganwila (DL_{2b})

Eastern part of the Dry zone has experienced a significant below normal rainfall during 2016/2017 Maha season with a 51 percent reduction compared to its long term average of 1,672 mm. Each month of the season did not receive expected amount of rainfall except in January. However, evaporative demand of the atmosphere remained well below the cumulative rainfall from November to January. Hence, there could be a possible soil moisture stress conditions unless supplementary irrigation was provided.

Yala rains of 2017 in this region were confined to customary convectional type rains in April and the rest of the season was dry with high daytime temperatures and strong winds. However, the tail end of this season managed to experience some good showers and therefore, a slight positive anomaly of rainfall could be observed compared to the long term average of 424 mm. The cumulative monthly potential evapotranspiration values of the current season were also above the monthly rainfall from April to July, a usual phenomenon in any given area in the region.

Weerawila (DL₅)

Recorded cumulative seasonal rainfall of 502 mm in 2016/2017 Maha was about 40 percent decrease compared to its long-term average. Except January, each month of the season did not receive expected amounts of rainfall compared to the long term average of respective months. Meanwhile, this region experienced an unusual dry weather condition during December and it may have caused soil moisture stress conditions in crops grown well drained soils in upper catenary positions in the landscape.

Meanwhile, as expected the amount and distribution of Yala rains of 2017 in this region was not conducive to raise a successful crop. The cumulative seasonal rainfall of the season was 237 mm which was about 21 percent reduction compared to its long term average. None of the month in the season was able to record a rainfall of 100 mm or more, the threshold value to designate any month as a 'wet month'. The cumulative potential evapotranspiration of each month of the season was much in excess of the cumulative rainfall of respective months resulting soil moisture stress in upland crops grown without supplementary irrigation was unavoidable. Meanwhile a high temperature regime was prevailed throughout the season along with intense radiation and high-speed winds. However, being the driest region of the country it is not an exceptional weather condition for the region during this time of the year.

Table 5.1: Total rainfall (mm) of 2016/2017 Maha & 2017 Yala seasons

Agro-met Station	Agro Ecological Zone	Maha 2016/17 Sep-Feb	Maha Ten Year Average (2006-15)	Yala 2017 Mar-Aug	Yala Ten Year Average (2006-15)
Bombuwela	WL _{1b}	1012.8	1501.0	1086.6	1655.6
Peradeniya	WM _{2b}	467.4	1533.0	975.7	947.1
Sita Eliya	WU ₃	610.4	1220.1	667.6	821.1
Batalagoda	IL _{1a}	636.3	1199.8	830.1	809.8
Makandura	IL _{1a}	275.6	1436.7	638.2	978.3
Moneragala	IL _{1c}	682.8	1277.5	690.2	645.7
Girandurukotte	IL ₂	1175.2	1800.2	416.0	489.1
Kundasale	IM _{3a}	429.2	1064.6	404.0	575.0
Bandarawela	IU _{3c}	549.2	1173.6	632.3	958.7
Maha Illuppallama	DL _{1b}	600.3	1085.6	652.8	433.7
Angunakolapelessa	DL _{1b}	689.8	860.4	454.7	469.3
Aralaganwila	DL _{2b}	815.5	1672.1	453.8	424.5
Weerawila	DL ₅	502.1	840.6	236.9	301.3

Table 5.2: Monthly total rainfall 2016/17 (mm)

Agro-met station	2016			2017								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	18.1	333.4	207.9	128.3	285.1	40.0	124.3	214.6	280.9	193.2	89.5	184.1
Peradeniya	17.0	61.8	187.5	37.2	116.6	47.3	291.5	48.9	263.6	123.5	123.8	124.4
Sita Eliya	28.1	58.6	132.1	72.9	197.2	121.5	206.2	73.2	172.1	64.7	25.8	125.6
Batalagoda	0.6	137.8	233.4	65.6	106.7	92.2	215.1	206.6	177.3	136.1	19.7	75.3
Makandura	1.5	82.5	152.5	4.0	20.6	14.5	121.5	15.2	269.4	134.8	23.1	74.2
Moneragala	51.9	123.9	165.4	94.2	170.1	77.3	209.0	110.5	179.6	5.4	101.8	83.9
Girandurukotte	0.0	72.8	424.7	168.1	371.6	138.0	143.3	28.3	155.0	2.0	8.2	79.2
Kundasale	1.1	78.0	166.0	36.4	81.4	66.3	163.8	24.5	70.3	56.0	16.4	94.2
Bandarawela	0.6	24.7	281.6	33.1	134.9	74.3	210.0	82.3	133.4	59.4	44.0	103.2
MahaIlluppallama	0.0	167.1	170.2	43.4	154.0	65.6	188.7	70.4	259.0	17.8	19.7	97.2
Angunakolapelessa	2.6	173.9	210.5	116.2	164.0	22.6	91.2	68.2	232.3	23.3	16.1	23.6
Aralaganwila	0.0	82.6	263.3	117.0	318.1	34.5	159.1	10.2	46.1	0.0	68.3	170.1
Weerawila	2.4	12.4	154.4	26.8	265.9	40.2	18.7	64.5	97.3	17.8	25.5	13.1

Table 5.3: Monthly 10-year averages of rainfall in mm (2006-2015)

Agro-met station	Month											
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	313.0	416.8	376.1	201.4	75.0	118.7	194.4	319.6	395.8	322.3	169.6	254.1
Peradeniya	151.3	670.2	298.9	255.5	87.5	69.6	138.0	266.7	120.9	160.7	138.6	122.2
Sita Eliya	156.1	280.8	267.2	275.9	138.8	101.3	123.6	170.7	172.3	145.1	114.8	94.6
Batalagoda	116.9	332.5	305.2	297.0	82.8	65.5	131.9	253.0	151.1	102.6	75.5	95.8
Makandura	185.5	415.4	530.5	186.0	41.5	77.9	142.1	217.6	208.2	209.5	72.7	128.2
Moneragala	89.5	291.6	378.1	269.6	152.3	96.4	117.2	265.8	102.2	34.1	48.4	78.0
Girandurukotte	102.9	265.5	368.7	595.2	277.8	190.2	120.4	181.1	67.5	15.5	38.3	66.4
Kundasale	90.1	283.2	256.1	264.4	101.1	69.7	95.9	176.7	81.9	89.0	58.3	73.2
Bandarawela	122.6	338.5	258.7	249.1	107.5	97.2	135.1	509.1	142.5	61.8	45.9	64.3
Mahalluppalama	88.4	273.3	294.1	255.3	95.7	78.8	110.3	185.0	60.5	8.0	16.9	52.9
Angunakolapelessa	107.7	175.5	233.6	209.0	82.8	51.8	93.4	129.8	85.6	51.9	32.7	75.9
Aralaganwila	66.9	291.7	372.3	534.4	241.2	165.7	89.6	141.2	76.5	17.0	28.0	72.3
Weerawila	50.5	186.8	251.1	220.1	82.7	49.5	71.8	115.1	44.4	17.9	9.5	42.6

Table 5.4: Monthly potential evapo-transpiration(mm) - 2016/17

Agro-met station	2016				2017							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	76.8	81.4	62.4	69.4	71.9	62.7	81.8	79.2	66.9	67.2	64.5	66.9
Peradeniya	81.6	96.7	67.2	71.9	81.8	87.3	86.8	88.8	69.4	67.2	81.8	64.5
Sita Eliya	57.6	59.5	36	54.6	62	71.7	81.8	86.4	57	48	64.5	49.6
Batalagoda	110.4	96.7	69.6	79.4	84.3	89.6	91.8	108	79.4	76.8	99.2	96.7
Makandura	105.6	106.6	91.2	74.4	101.7	94.1	91.8	86.4	74.4	60	74.4	79.4
Moneragala	112.8	99.2	105.6	76.9	121.5	65	81.8	84	71.9	76.8	91.8	89.2
Girandurukotte	132	106.6	*	*	*	65	81.8	93.6	101.7	105.6	114.1	89.3
Kundasale	88.8	91.8	52.8	67	71.9	76.1	74.4	86.4	84.3	74.4	96.7	76.9
Bandarawela	91.2	69.4	40.8	54.6	62	53.8	59.5	64.8	74.4	72	74.4	59.5
Mahalluppallama	122.4	99.2	55.2	54.6	57	67.2	86.8	98.4	94.2	100.8	124	106.6
Angunakolapelessa	141.6	126.5	57.6	84.3	89.3	91.8	111.6	115.2	109.1	100.8	126.5	114.1
Aralaganwila	180	136.4	50.4	76.9	69.4	69.4	94.2	112.8	116.6	148.8	166.2	133.9
Weerawila	112.8	*	43.2	76.9	96.7	82.8	94.2	105.6	121.5	117.6	156.2	146.3

* - Data not available

Table 5.5: Maximum and minimum air temperature (°C) – 2016/17

Agro-met station	2016								2017															
	Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		June		July		Aug	
	Max	Min																						
Bombuwela	30.2	25.5	30.6	24.1	30.5	23.5	31.6	22.6	31.3	21.6	30.8	21.8	31.6	23.4	32.2	24.4	31.6	25.3	30.7	25.3	30.9	25.7	30.3	25.1
Peradeniya	28.2	22.1	30.5	20.9	28.9	20.9	29	19.9	28.5	18.4	29.7	19.7	30.8	19.9	31.9	21.4	30.3	22.8	28.8	22.6	29.4	22.9	28.9	22.5
Sita Eliya	18.6	12.7	20.2	12	19.3	12.7	19.6	12	18.9	10	20	10.1	21.9	10.9	23.3	11.1	22.1	13.3	20	13.5	19.8	13.7	19	13.7
Batalagoda	31.9	24.6	32	23.1	30.3	22.5	30.3	21.9	29.3	20.3	30.7	20.9	32.4	22.1	33.4	23.8	32.2	24.6	31.3	24.5	30.7	24.5	30.7	24.3
Makandura	31.3	25.3	30.8	24.6	30.8	24.1	30.9	24.1	31	22.4	31.3	22.7	32.7	23.5	32.5	25.3	33.2	24.7	31.3	25.1	31.6	25.3	31.1	25.2
Moneragala	35.6	21	34.8	21.8	31.1	22.5	32.2	20.6	30.8	19.4	30.5	21.1	33.3	21.3	35.3	22.1	34.1	23	35.2	22.3	36.6	22	34.9	22.6
Girandurukotte	36.1	22.4	36	22.3	30.5	22.8	30.6	22.8	28.5	20.7	30.1	20.8	32.4	21.9	35.1	22.5	35.5	22.1	35.7	23.3	36.5	22.9	34.3	79.2
Kundasale	30.5	21.8	31.7	20.7	29.4	20.4	29.7	19.4	29	17.2	29.9	18.4	31.3	19.7	32.6	20.8	31.9	21.5	30.4	22.5	31.2	22.6	30.5	22.4
Bandarawela	28	15.6	27.3	15.5	24.6	16.7	25.1	15.1	23.3	14.1	24.8	13.5	26	14.5	27.9	15.2	28.1	17.3	27.6	16.7	28.5	16.6	27	16.7
Maha Illuppallama	33.7	24.9	33.5	23.8	30.7	22.4	30.6	21.2	30	20.1	30.8	20	33	22.1	34.8	24.4	33.4	24.4	32.9	24.7	34.5	25	33.5	24.9
Angunakolapelessa	34.3	25.1	34.1	24.6	31.4	23.7	31.4	23.1	31.2	21.7	31.4	22.1	32.4	23.5	34.6	24.9	33.7	25.7	32.8	25.4	34	25.6	33.3	25.3
Aralaganwila	36	20.8	35.6	20.6	30.5	20.6	30.9	20.1	29.3	18.7	30.6	19.4	32.7	20.6	36.1	20.7	35.6	21.5	35.2	21.3	36	20.1	34.3	19.6
Weeravila	32.4	25.1	33.1	25	31.4	24	31.3	23.7	32.5	22.2	31.1	22.8	32.2	23.9	33.4	24.9	33.7	25.5	32.7	25.7	34.5	24.7	34.2	25.4

Table 5.6: Relative humidity (%) – 2016/17

Agro-met Station	2016								2017															
	Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		June		July		Aug	
	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bombuwela	81	75	82	74	86	75	80	76	81	68	84	69	80	73	82	74	81	75	86	80	81	77	82	79
Peradeniya	77	69	76	72	81	61	74	61	73	57	74	66	80	69	76	74	77	76	81	72	78	75	80	79
Sita Eliya	95	95	91	95	95	96	76	85	70	82	64	77	69	76	62	71	85	88	93	91	88	87	91	92
Batalagoda	73	60	73	66	91	83	91	72	83	65	80	55	85	64	80	59	82	70	82	69	80	69	81	67
Makandura	89	82	89	81	88	79	91	79	90	74	87	71	90	73	84	67	82	74	91	89	86	77	87	76
Moneragala	75	66	77	68	83	81	85	72	84	75	84	72	85	74	87	69	86	73	81	69	81	66	83	77
Girandurukotte	62	49	67	52	86	78	87	70	88	73	88	67	85	68	81	51	76	49	70	50	68	47	75	54
Kundasale	70	60	70	57	78	73	79	63	81	62	79	58	83	63	78	55	77	66	76	68	70	60	76	66
Bandarawela	59	53	64	64	81	78	72	67	80	72	78	67	79	70	73	68	77	72	84	87	82	83	67	67
MahaIlluppallama	76	52	78	57	89	75	90	64	90	65	90	57	86	58	82	51	82	63	79	61	76	54	79	57
Angunakolapelessa	78	66	80	71	89	83	85	77	87	76	87	75	86	77	82	74	80	75	82	74	77	65	81	69
Aralaganwila	60	49	69	57	85	71	83	65	87	68	85	65	84	65	77	55	75	63	70	59	65	49	73	59
Weeravila	63	51	63	58	78	72	74	67	70	61	74	64	76	68	72	71	74	67	73	67	71	59	71	58

M - Reading at 8.30 hours

E - Reading at 15.30 hours

Table 5.7: Bright sunshine hours – 2016/17

Agro-met station	2016				2017							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	8.2	7.9	5.2	8	8.4	7.9	7.9	8.6	6.1	6.7	7.7	6.7
Peradeniya	3.4	3.9	2.5	2.9	3.3	3.9	3.5	3.7	2.8	2.8	3.3	2.6
Sita Eliya	1.5	2.9	2	5.9	5.9	7.4	6.1	8.0	4.6	4.1	5.8	3.2
Batalagoda	9.8	5.7	3	4.1	4.3	4.2	-	3.7	6	7.2	7.3	7.3
Makandura	*	*	*	*	*	*	*	*	*	*	*	*
Moneragala	4	10	17	8	11	5	12	5	11	2	10	10
Girandurukotte	6.4	6	2.5	4	5.2	5.7	6.8	8	5.2	5.7	6.4	6.4
Kundasale	7.5	6.4	5.6	5.7	7.2	7.5	7.6	6.9	6.5	6	6.3	5.9
Bandarawela	6.9	4.8	3.1	6	5.2	5.5	5.8	6.9	5.3	6.5	7.4	6
Maha Illuppallama	8.9	7.5	4.9	6.7	*	*	*	*	*	*	*	*
Angunakolapelessa	7.9	7.1	3.7	6.5	6.1	6.9	7.3	7.9	6.1	7.2	7.7	7
Aralaganwila	9.4	8	3.9	7.7	6.8	8.1	8.1	9.2	7.6	8.4	9.1	8.8
Weeravila	34.8	34.6	31.4	32.5	32.5	31.1	32.2	33.4	33.7	32.7	34.5	34.2

* - Data not available

Table 5.8: Wind velocity (kmph) – 2016/17

Agro-met station	2016				2017							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	5.3	3.8	2.3	2.7	*	*	*	*	*	*	4.6	5
Peradeniya	3.8	2.8	3.1	4.1	5.5	5.2	2.6	2.5	3.2	3.9	3.8	3.5
Sita Eliya	13.2	5.3	4	6	5.5	6.5	4.1	3.1	7.5	15	12.3	12.4
Batalagoda	9.8	5.7	3	4.1	4.3	4.2	*	3.7	6	7.2	7.3	7.3
Makandura	4.1	4.1	3.5	4.2	4.2	4.2	4.1	2	*	*	*	*
Moneragala	0.7	0.6	0.5	0.7	1.2	1.1	0.6	0.6	0.7	1	0.6	1
Girandurukotte	2.6	1.9	1.2	1.3	1.1	1.1	1.5	1.7	2	2.1	2.1	2.2
Kundasale	3.3	3.7	0.6	1	0.9	0.9	0.7	1.1	1.6	2.2	2.7	2.4
Bandarawela	4.9	3.1	2.3	3.2	3.4	3.5	3	2.8	3.6	4.1	4.5	4.2
Maha Illuppallama	8.7	5.6	3.3	4.2	*	*	*	*	*	*	*	*
Angunakolapelessa	6.5	5.3	3.2	4	4.8	5.6	4.1	4.1	5.3	5.1	5.7	5.6
Aralaganwila	5.1	3.3	1.8	2.4	2.1	2.2	1.7	2	3.3	5.3	4.6	4.2
Weeravila	9.1	6.1	1.8	2.4	2.7	2.4	1.7	2.8	6.2	7.5	7.6	7.5

* - Data not available

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P. Atputhachandran	B.Sc., DPD, Agric. Extension & Development
T. Yogeswaran	B.Sc., DPD, Agric. Extension & Development

**PROVINCIAL DIRECTOR OF
AGRICULTURE, EASTERN
PROVINCE**

S.M. Hussain	Ph.D., PDA, Agric. Extension
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R. Kokulathasan	B.Sc., DPD, Agriculture
R. Hariharan	B.Sc., DPD, Gender
D.M.S.B.	B.Sc., ADA,
Dissanayake	Agriculture
V. Perinparaja	B.Sc., ADA, Agric.
	Development
Parameswaran	B.Sc., ADA, Agric.
	Development

PROVINCIAL DIRECTOR OF AGRICULTURE, CENTRAL PROVINCE

P.R.P.Y. Pallemulla	Postgrad. Dip., PDA, Soil Science
S.M.K. Dissanayake	B.Sc., DPD, Crop Science
P.K. Seneviratne	B.Sc., DPD, Crop Science
M.P.K. Dodanwala	M.Sc., DPD, Organizational Mgt.
M.G.N. Sandamali	M.Sc., ADA (D), Crop Science
R.S. Chandrasiri	M.Sc., ADA (D), Crop Science
M.G.M.K. Weerasooriya	M.Sc., ADA (D), Crop Science
W.J. Samarawickrama	M.Sc., ADA (D), Crop Science
K.A.N. Wijesinghe	B.Sc., ADA (D), Crop Science
B.H.K. Thakshila Kumari	B.Sc., ADA (D), Food Science & Technology
W.M.D.K. Wijerathnayake	M.Sc., ADA (D), Landscape Architecture & Floriculture
K.TB.. Dissanayake	Dip. In Agric., ADA (D), Agriculture

PROVINCIAL DIRECTOR OF AGRICULTURE, SOUTHERN PROVINCE

Mahesh Subasinghe	Dip. in Agric., PDA, Agric. Extension
S.K.N. Rubasinghe	B.Sc., DPD, Agric. Extension
I.D. Gunawardhana	B.Sc., DPD, Agric. Extension
D.N. Gunawardhana	M.Sc., ADA (D), Agric. Extension
N.M.A. Dharmapriya	B.Sc., ADA (D), Agric. Extension
S. Wanigasekara	Dip. in Agric., ADA (D), Agric. Extension
H.K.D.K. de S. Siriwardhana	B.Sc., ADA (D), Agric. Extension
W.G.M. Wickramasinghe	B.Sc., ADA (D), Agric. Extension
K.S. Pushpakanthi	B.Sc., ADA (D), Agric. Extension
S.D.W. Gunasekera	B.Sc., ADA (D), Agric. Extension
D.A. Palihawadana	M.Sc., ADA (D), Agric. Extension
M.W.R. Wasana	B.Sc., ADA (D), Agric. Extension

NATIONAL AGRICULTURE INFORMATION & COMMUNICATION CENTRE, GANNORUWA

R.D. Siripala	M.A., Director, Media
S. Periyasamy	M.Sc., DD (Communication), Agric. Extension

I.S.M. Haleemdeen	M.Sc., ADA (D), Agric. Economics
H.G.H.J.K. Keerthiratne	M.Sc., ADA (D), Communication & Extension
T.A. Kamiss	B.Sc., ADA (D), Agriculture
M.F.M. Rizwan	B.Sc., ADA (D), Agric. Extension

PUBLICATION CENTER,

GANNORUWA

J.K.A. Hettiarachchi	M.Sc., Addl. D., Natural Resource Management
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FARM BROADCASTING

SERVICE

W.L. Hiran Peiris	M.Sc., DD, Sustainable Agriculture
M.A. Chandanie	M.Sc., ADA (D), Horticulture
I.P. Liyanage	M.Sc., ADA, Agriculture
R.A.T.M. Ramanayake	B.Sc., ADA (D), Agriculture

AGRO TECHNOLOGY PARK,

GANNORUWA

I.G.K. Janaka	M.Sc., ADA (D), Agric. Extension
W.M.K.R. Wickramasinghe	M.Sc., ADA (D), Crop Science

AGRO TECHNOLOGY PARK,

BATA ATHA

K.R.W. Keerthi	B.Sc., ADA (D), Agriculture
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ADMINISTRATION

DIVISION

P.M.D. Pallawala	M.Sc., Director (Administration), Public Management
K.G.S.P. Kaluarachchi	M.A., Director (Establishment), Public Management
W.S.P. Wickramaarchchi	M.A., Asst. Director (Administration), Public Policy
H.M.D.S. Wijerathna	B.Sc. (Agric.), Asst. Director (Establishment I), Public Administration
D.M.R.C. Dassanayake	B.A., Asst. Director (Establishment II), Public Administration

ENGINEERING DIVISION

P. Rajapakse	C. Eng, B.Sc. (Eng.) Civil, Civil Engineer
M.A. Shantha Kumara	C. Eng., B.Sc.(Eng.) Mechanical, Mechanical Engineer
C.L. Rajapakse	C. Eng., B.Sc.(Eng.) Mechanical, Mechanical Engineer
B.M.W.L. Balasooriya	C. Eng., B.Sc. (Eng) Mechanical, Mechanical Engineer
A.K.S.P.S. Wijayasoma	B.Sc. (Eng.) Electrical, Electrical Engineer
A.P.A.P.S. Iyanthirathne	B.Sc. (Eng.) Civill, Civil Engineer
K.M.P. Sameera	B.Sc.(Eng.) Civil, Civil Engineer

L.L.R.R. Lokuliyana	B.Sc. (Eng.) Mechanical, Mechanical Engineer	M.F.M. Faiz	B.Com., PDAF, Chief Internal Auditor
K.A.D. Peiris	B.Sc. (Eng.) Mechanical, Mechanical Engineer	W.A.G. Weerasingha	ICASL Inter., PGDA, DD (Finance)
P.N.W.A.K. Gunarathne	B.Tech. (Eng.) Civil, Civil Engineer	M.A. Kumara	B.Sc. (Mgt.) Pub. Sp., DD (Finance)
D.M.B.R. Deegala	Civil Engineer, Diploma	K.S.D. Dissanayake	M.A. (Economics), B.Sc. (Mgt.) Pub., DD (Finance)
		C.P. Ruwanpitiya	B.Com.Sp., PGDE, CBA, AD (Finance)

FARM MECHANIZATION

RESEARCH CENTRE

B.M.C.P. Balasooriya	C. Eng., B.Sc. (Eng.), DD, Mechanical Engineering, Agricultural Mechanization	H.G.I. Madusanka	B.Com.Sp., IPFDA, AD (Finance)
H.M.A.P. Herath	B.Sc.(Eng.), Mechanical Engineer, Mechanical Engineering, Agricultural Mechanization	H.M.U.S. Digashani	M.A., B.Com.Sp., AD (Finance)
G.A.M.A. Wijethunga	B.Sc. (Eng.), Mechanical Engineer, Mechanical Engineering, Agricultural Mechanization	K.D.L.M. Jayamini	M.A.(Economics), B.Com Sp., AD (Finance)
M.H.J.J. Hemachandra	B.Sc. (Eng.), Mechanical Engineer, Mechanical Engineering, Agricultural Mechanization	R.M.G.T.N. Amarasena	BBA Sp.,CMA stg level, ICASL stg I, AD (Finance)
		S.N. Jayasingha	B.A., CBA, MAAT, AD (Finance)
		A.M.M.K. Ratnayake	B.Sc. (Mgt.), CBA, AD (Finance)

FINANCE DIVISION

R.P. Premarathna	B.Com (Special), PGDAF, IPFDA, HNDC, Chief Accountant
C.K. Rajapathirane	M.A, PDA, B.Com, HNDA, DD (Finance)

PROGRESS MONITORING & EVALUATION UNIT, PERADENIYA

P.C. Peiris	M.Sc., Addl. D, Agricultural Systems
S.G. Dombagolla	M.Sc., ADA (D), Crop Science

* On study leave

** On no pay leave

*** Temporary transfer to Gannoruwa

8. TECHNICAL STAFF QUALIFICATIONS

(As at 2017.12.31)

Institute/ Centre/ Division/ Unit		Diploma	B.A./L.L.B./ BLIS	B.Com./BBA/ B.M.S./ B.Tec./B.Ed.	B.Sc.	C. Eng/ M.I.E.	Postgrad. Dip.	M.A./ MBA	M.Sc./ M.Ed.	M.Phil.	Ph.D.	TOTAL
FCRDI	FCRDI	18			09		01		15	03	01	47
	GLORDC	13	03		08			02	09		01	37
	RARDC/ ARL	12			01				02		01	16
	RARDC/ KIL	05			10				02		02	19
HORDI	HORDI	20	01	02	31			01	15	04	03	77
	FRU	01			03				04			08
	RARDC/BAN	15	01		17				07	02		42
	RARDC/MK	26	04		05				03			38
	ARDC/SE	09			04							13
	ARS/TW	07	03		07				04			21
	ARS/GK	08			03				01			12
FRDI	FRDI	40	05		17				10	01	02	75
	FCRDS	10	01		01				02		01	15
	PVIC	12		01	07				05		01	26
RRDI	RRDI	49	12		20				25	04	02	112
	RARDC/BW	23			11				08	01		43
NRMC		19	02		05				10	01	04	41
SCPPC	SCPPC				02				04			06
	SCS	149		13	22				05	01	01	191
	PPS	09			02				04			15
	ROP	09			06				08		01	24
	PGRC	09	02		02		01		06		02	22
	NPQS	86	01		27				19		01	134
SPMDC		212	32	02	32			01	22			301
SEPC		03	14		02			05	11	01	02	38
ETC		513	25	02	119		02	02	87	02		752
NAICC		113	18		20			01	08			160
Administration Div.		05	37	04	15			01				62
ENG	ENG	11		01	09	03						24
	FMRC	10			04	01						15
Finance Div.			03	10	01		01	01				16
PMEU		05	07	04					06			22
TOTAL		1421	171	39	422	04	05	14	302	20	25	2423

ARL – Aralaganwila
KIL – Kilinochchi

BAN - Bandarawela
MK – Makandura

SE – Sita Eliya
TW – Telijjawila

GK - Girandurukotte
BW - Bombuwala

9. STAFF POSITION

(As at 2017.12.31)

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E		
1	Director General of Agriculture	1	1																															1	1
2	Additional Director General of Agriculture (Research)	1	0																															1	0
3	Additional Director General of Agriculture (Development)	1	0																															1	0
4	Additional Director General (Administration)			1	1																													1	1
5	Director of Agriculture												1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	0	1	1	10	5	
6	Director (Administration) I			1	1																												1	1	
7	Director (Establishments) I			1	1																												1	1	
8	Chief Accountant							1	1																								1	1	
9	Chief Engineer					1	0																										1	0	
10	Additional Director of Agriculture											1	1	1	0	3	2	2	0	1	1	1	1	1	1	5	1	4	3	5	4	4	3	28	17
11	Principal Agriculture Scientist	3	0													10	1	5	3	5	2	6	1	3	3	5	2						37	12	
12	Principal Agriculturist	9	0																										3	3	1	0	13	3	

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total		
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	
13	Registrar of Pesticides																								1	0									1	0
14	Accountant Class I							2	2																										2	2
15	Chief Internal Auditor									1	1																								1	1
16	Engineer (Civil/ Electrical/ Mechanical) Class - I					1	1																												1	1
17	Engineer (Mechanical Research) Class - I					1	0																												1	0
18	Assistant/ Deputy Director (Establishment)			2	2																														2	2
19	Assistant/ Deputy Director (Administration)			1	1																														1	1
20	Deputy Director of Agriculture											2	0	2	0	7	0	8	0	4	0	6	0	6	0	22	0	20	0	20	0	9	0	106	0	
21	Deputy Registrar of Pesticides																								1	0									1	0
22	Assistant Director of Agriculture (Agricultural Development)											2	1			4	1	0	3	5	3	6	4	5	3	53	30	33	29	201	109	32	15	341	198	
23	Assistant Director of Agriculture (Agricultural Research)	6	0			2	0								109	44	87	48	38	17	59	30	25	6	55	20	1	0					382	165		
24	Assistant Director of Agriculture (Agricultural Economics)											1	0	13	8	3	2	3	0	1	0	1	2											23	12	

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total		
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	
25	Accountant Class (II/III)							10	9																									10	9	
26	Engineer (Civil)					4	4																											4	4	
27	Engineer (Mechanical)					8	8																								1	0			9	8
28	Engineer (Electrical)					1	1																											1	1	
29	Legal Officer			1	0																													1	0	
30	Assistant Director (Information & Communication Technology)																																1	0	1	0
31	Lecturer (Tamil Medium) - Contract																															19	10		19	10
32	Lecturer (English Medium) - Contract																															43	0		43	0
33	Administrative Officer			8	4	1	1							1	0	6	2	4	3	1	1	3	1	1	1	4	1	2	2	5	3	1	0	37	19	
34	Librarian (Supra Grade)																																1	0	1	0
35	Agriculture Instructor (Special)															7	0	11	2	6	0	4	3	1	0	11	4	30	2	22	8	6	1	98	20	
36	Research Assistant (Special)															7	1	7	4	3	1	3	1	1	1	3	3			1	0			25	11	
37	Economic Assistant												1	0	10	7	3	1	3	2	1	1	1	0					1	0	1	0			21	11

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total			
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E				
38	Translator (English/Tamil/Sinhala)			2	2			1	0			3	4																	1	1			7	7		
39	Information and Technology Officer																															19	13	19	13		
40	Agriculture Monitoring Officer					1	1										1	1	1	1	2	2			11	11	3	3	13	13	1	1	33	33			
41	Program Assistant (Agriculture)	4	1			2	0					6	1	11	1	16	2	31	20	21	7	2	11	4	2	20	15	15	5	38	16	7	2	177	83		
42	Legal Assistant			2	1																												2	1			
43	Media Assistant																															5	2	5	2		
44	Audio Visual Assistant																															5	3	5	3		
45	Development Officer	2	2	27	33	7	7	26	39	3	2	5	10	8	12	15	10	24	15	12	4	24	22	6	6	50	29	80	52	60	64	20	22	369	329		
46	Librarian (I/II/III)															2	0															1	1	2	1	5	2
47	Soil Surveyor																							5	3									5	3		
48	Agriculture Instructor					2	2					2	1	0	1	26	13	50	51	25	20	25	27	7	9	206	178	210	160	534	306	57	51	1144	819		
49	Research Assistant															74	47	84	59	46	29	68	49	7	1	33	32	3	1	0	1			315	219		
50	Engineering Assistant (Civil)					15	7									3	0	2	0	1	0	2	0			1	0	10	0	6	0			40	7		
51	Technical Officer					0	1																							3	1			3	2		
52	Public Management Assistant	4	4	98	88	18	15	90	62	13	11	2	2	8	7	34	23	43	42	17	17	30	30	7	6	49	42	109	82	97	89	22	17	641	537		

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E		
53	Technological Assistant (Extension)					7	4					2	3	3	3	21	17	28	28	10	19	25	20	1	1	72	62	83	83	254	246	25	26	531	512
54	Technological Assistant (Research)															9	3	1	4			3	2					2	2	0	1			15	12
55	Technological Assistant (Engineering-Civil)					9	20									2	1	3	0	1	2	2	0			0	1	11	4	6	4			34	32
56	Information and Technology Assistant																															50	0	50	0
57	Agriculture Extension Services Officer																			15	13													15	13
58	Photographer																														3	3	3	3	
59	Bee Demonstrator																												2	1			2	1	
60	Farm Clerk															3	3	8	10	6	7	3	3			3	0	42	29	12	6	3	2	80	60
61	Male Warden																					0	1							11	9			11	10
62	Female Warden																												4	4			4	4	
63	Audio Visual Technician																														1	1	1	1	
64	Seed Technician																									24	20							24	20
65	Artist																													3	3	3	3		
66	Driver	2	2	8	9	10	10	6	7			3	3	6	6	27	22	28	26	11	13	22	21	6	7	39	37	76	67	72	69	17	18	333	317

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total		
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	
67	Cinema Operator																																1	1	1	1
68	Press Foreman																																1	0	1	0
69	Tractor Operator					2	0									13	6	12	10	4	4	10	7			5	4	37	38	15	13	2	1	100	83	
70	Storeman			1	1	3	4									4	3	7	6	3	3	2	1	0	1	5	6	32	25	14	11	3	4	74	65	
71	Plant Yard Attendant					4	3																					10	2	4	6			18	11	
72	Mechanic					27	23									3	2	5	3	1	0	3	2					2	2	4	3			45	35	
73	Machinist					13	10											3	3												2	1			18	14
74	Carpenter					5	3									5	1	5	2	1	0	2	0					0	2	9	2	3	1	30	11	
75	Mason					5	0									4	0	4	1	1	0	2	0					2	1	8	0	4	0	30	2	
76	Electrician					3	2									3	1	5	2	1	0	1	0			6	4	2	1	3	1	1	1	25	12	
77	Machine Minder																															4	3	4	3	
78	Video Editor																															4	4	4	4	
79	Audio Recorder																															4	4	4	4	
80	Technician					19	16								0	1	7	5	10	9	1	1	1	1		1	1	13	7	12	11	4	4	68	56	
81	Video/ Photographer Assistant																															4	4	4	4	
82	Composer																															4	3	4	3	

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total		
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	
83	Research Sub Assistant															25	19	24	18	10	3	10	7	2	2	9	7			0	3			80	59	
84	Book Binder (Press)																														2	2	2	2		
85	Bee Keeper																	0	1											12	8	1	0	13	9	
86	Budder															3	1	6	8	11	10						43	38	8	7			71	64		
87	Steward																												1	0			1	0		
88	Cook																				2	2							38	29			40	31		
89	Seedman																								30	30							30	30		
90	Circuit Bungalow Keeper															4	3	5	4			2	1			2	2	7	6	2	2			22	18	
91	Lorry Cleaner															0	1	1	1			0	1			3	2	21	7	2	1	1	1	28	14	
92	Office Employee	4	3	23	25	3	2	10	10	1	1	1	1	1	1	6	4	6	6	3	1	5	4	1	2	9	7	3	8	21	18	3	2	100	95	
93	Video Lighting Electrical Assistant																																4	4	4	4
94	Video Editing Assistant/Video Assistant/ Demonstration Assistant																																6	6	6	6
95	Waiter																												4	3			4	3		
96	Watcher			8	8	12	11									87	68	69	65	37	42	36	32	2	3	67	57	191	188	115	106	32	34	656	614	
97	Laborer	4	1	16	15	20	12	9	9	1	1	1	1	2	2	243	167	183	131	88	58	91	66	3	3	78	57	272	211	260	187	49	14	1320	935	

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		NAICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E		
98	Laborer (As per 25/2014 Circular)	1	1	4	4	26	26	7	7	1	1	2	2	1	1	452	462	293	293	173	173	179	179	5	5	110	112	1135	1071	363	339	147	147	2899	2823
99	Sanitary Laborer			2	2													2	2							1	1	3	3	4	4			12	12
100	Contract Laborer	1	1	10	5	12	12	4	4			2	2	2	2	148	148	109	109	142	142	132	132	25	25	90	90	493	493	165	115	97	67	1432	1347
	Total	43	16	216	203	244	206	166	150	20	17	36	32	70	52	1399	1087	1183	995	708	596	777	666	125	92	1085	869	3002	2627	2503	1839	677	492	12254	9939

A - No. Approved

E - No. Existing

DG - Director General's Office

Admin - Administration Division

Eng - Engineering Division

Fin - Finance Division

Audit - Internal Audit Unit

PMEU - Progress Monitoring & Evaluation Unit

SEPC - Socio Economic & Planning Centre

FCRDI - Field Crop Research & Development Institute

HORDI - Horticultural Crop Research & Development Institute

FRDI - Fruit Research & Development Institute

RRDI - Rice Research & Development Institute

NRMC - Natural Resources Management Centre

SCPPC - Seed Certification & Plant Protection Centre

SPMDC - Seed & Planting Material Development Centre

ETC - Extension & Training Centre

NAICC - National Agriculture Information & Communication Centre