76th

Annual Report

of the

Coconut Industry Board

for year ended December 31, 2017

MISSION

To promote the interest of the Jamaican coconut industry and its stakeholders, by encouraging and facilitating the efficient production of coconuts, providing ongoing research support, developing marketing opportunities, locally and globally, and administering regulations for the purchase, sale, exportation and importation of coconut products and substitutes, in order to develop a profitable and sustainable industry.

VISION

To lead, facilitate and co-ordinate a vibrant and efficient coconut industry which will improve the socio-economic conditions of the coconut growers, processors, traders and other stakeholders who rely on the crop for a livelihood.

Presented to
The Minister of Industry, Commerce, Agriculture and Fisheries
in pursuance of Section 27
of the Coconut Industry Control Act

COMPOSITION OF BOARD FOR YEAR 2017

MEMBERS

Nominated:	Mr. C. Gentles - Chairman Mr. H. Davis Dr. C. Douglas Mr. H. Gentles
Elected:	Mr. S. Black Mrs. S. Ennis Mr. G. E. Marsh Hon. F. M. Phipps, Q.C., O.J. Hon. A. A. Pottinger, C.D.

OFFICERS

General Manager:	Miss Y. E. Burns
Corporate Secretary:	Mrs. A. J. Chung-Campbell
Bankers:	National Commercial Bank Jamaica Limited
Auditors:	PriceWaterhouseCoopers

CONTENTS

THE COCONUT INDUSTRY BOARD

INTRODUCTION

The Coconut Industry Board was established under the Coconut Industry Control Act, Cap. 62, enacted in 1945 and consists of nine members, four of whom including the Chairman, are appointed by the Minister of Agriculture and Fisheries. The remaining five are elected by registered coconut growers and must themselves be registered coconut growers or the attorneys for such registered coconut growers or the managing directors or managers of companies which are registered coconut growers.

The Board promotes the interests and efficiency of the coconut industry, encourages the production of coconuts and regulates the purchase, sale and exportation of coconuts as well as the importation of coconut products and substitutes.

Allied functions are:

(a) Keeping Government informed on the state of the industry and advising Government when any action is necessary.

(b) Arranging for the issuing of licences to manufacturers of coconut products.

(c) Arranging insurance of coconut trees against damage by windstorm.

(d) Assisting growers to market their crop.

(e) Carrying out research on the agricultural problems of the industry and advising growers on their agricultural problems.

The industry offers a wide range of employment for technical and skilled personnel.

REPORT ON THE OPERATIONS OF THE COCONUT INDUSTRY BOARD CALENDAR YEAR 2017

1. BOARD MEMBERSHIP

There was one vacancy among the elected members of the Board during Year 2017, as Mrs. Sandra Ennis of Portland, the growers' representative, who automatically retired, was elected unopposed.

There were 46 Board and Committee meetings during the year and attendance of members was as follows:

	ATTENDANCE			
	Possible	Actual		Ill/On Leave
		Board	Committee	
Mr. C. Gentles	46	19	27	-
Mr. S. Black	25	15	7	3
Mr. H. Davis	25	11	8	6
Dr. C. Douglas	27	18	9	-
Mrs. S. Ennis	31	19	12	
Mr. H. Gentles	25	14	6	5
Mr. G. E. Marsh	36	18	16	2
Hon. F. M. Phipps, Q.C.,O.J.	28	16	11	1
Hon. A. A. Pottinger, C.D.	32	19	13	

2. PROFILE OF THE LOCAL COCONUT INDUSTRY

The number of hectares in coconuts at 31 December, 2017 was calculated as 15,989 (31/12/16 - 16,077); the number of hectares in bearing coconuts at the same date was calculated as 15,589 (31/12/16 - 14,892).

At 31 December 2017, the total population of coconut trees was calculated as 3,602,977 (31/12/16 - 3,568,760). Of this number 3,340,663 were seven years old and over (31/12/16 - 3,309,930).

The number of farmers registered with the Board was as follows:

Year	No. of Farmers
2017	694
2016	664
2015	697
2014	780
2013	891

The majority of coconut farms was smaller than 10 hectares; coconut is essentially a small holder's crop.

3. PRODUCTION AND DISPOSAL

(i) Production

Coconut production during the year was calculated as 126.3 million nuts (Year 2016 adjusted due to drought conditions – 100.1 million nuts). The value of the Year 2017 production at the average price paid by the Board for Maypan and Malayan Dwarf jelly coconuts during the year, ($45.00 per nut) was $5.68 billion.

Coconut production during the year was again adversely affected by lack of fertilizer, improper agronomic practices and additional deaths of bearing coconut trees from lethal yellowing and other diseases.

(ii) Disposal

The major portion of the Year 2017 production was disposed of through bottlers of jelly coconut water, the Coconut Industry Board, higglers, producers of coconut oil and supermarkets.

The portion of the crop which was disposed of to and through the channels of the Board during Year 2017 and the four preceding years, was as follows:

	N	U	T	S		
	2017 '000	**2016 '000**	**2015 '000**	**2014 '000**	**2013 '000**	**TOTAL '000**
St. Andrew	2	1	1	4	12	20
St. Elizabeth	157	173	103	105	113	651
St. Thomas	33	45	137	121	77	413
Portland	29	56	54	68	73	280
St. Mary	667	467	651	874	852	3,511
St. Catherine	116	322	135	49	-	622
	1,004	**1,064**	**1,081**	**1,221**	**1,127**	**5,497**

4. THE COCONUT SHOP

The Board purchased 795,721 coconuts at a cost of $46,057,458 during the year (848,548 at a cost of $41,219,069 in Year 2016), for sale in its Coconut Shop at 18 Waterloo Road, Kingston 10.

This shop continued to be a significant market for the purchase/sale of growers' coconuts.

5. EXPORT

During the year, the Board exported seed coconuts to Florida in the United States of America.

The total number of seed coconuts exported during Year 2017 was 42,500 at a F.O.B. value of US$135,500.

Export of seed coconuts during the five years ended 31 December, 2017, was as follows:

Year	Number Exported	F.O.B. Value (US$)
2017	42,500	135,500
2016	33,000	108,500
2015	47,850	149,100
2014	52,200	169,050
2013	21,000	64,600
	196,550	626,750

6. DISTRIBUTION OF SEEDLINGS

Distribution of coconut seedlings was as follows:

	2017	2016
Old Planting Programme	33,732	18,029
New Planting Programme	22,025	15,113
Sales	5,977	2,422
Donations and Field Experiments	2,189	946
Replanting – the Board's Seed Gardens	700	-
Agricultural Shows	500	375
Lethal Yellowing Tree Felling Programme	300	30
	65,423	36,915

At the Board's hybrid seed garden in Barton Isles, St. Elizabeth, a total of 183,954 Maypans was produced in Year 2017 (Year 2016 - 162,094).

In addition, the Board continued to encourage farmers to plant coconut seedlings under the two planting programmes. Under the Old Planting Programme, weed control grant and fertilizer for 80% of the seedlings planted, the percentage which is expected to survive, are given free of cost to qualified farmers.

The old programme covers St. Thomas, Portland, St. Mary, St. Ann and St. Catherine, the traditional coconut growing areas.

Planting continued under the New Planting Programme which covers the non-traditional coconut growing areas, the western region of the island.

To qualify under the programmes, a farmer must be registered with the Board and must have land which can accommodate at least 125 coconut seedlings. The demand for seedlings exceeded the supply in Year 2017.

A total of 55,757 coconut seedlings at a cost of $9.0M, fertilizer and weed grant valued at $3.03M were distributed to coconut farmers under the two planting programmes for Year 2017.

7. WINDSTORM INSURANCE FUND

(i) Liability

The Fund continued to indemnify coconut growers against loss of bearing coconut trees to windstorm.

The liability for windstorm insurance damage during Year 2017 was $72,850,870 (Year 2016 - $73,268,809); the maximum coverage per tree remained at $1,000.

The finances of the Windstorm Insurance Fund are kept separately from the funds of the Board and are treated as Trustee Funds.

(ii) **Automatic Insurance and Voting Rights**

Coconut growers are again being reminded that they can earn automatic insurance and voting rights for the election of Board members, on coconuts sold to the Coconut Industry Board and licensed coconut dealers, including bottlers of coconut water, provided the sales are reported to the Board. We are reminding coconut growers that it is in their interest to ensure that all coconuts sold by them to the other entities, are reported to the Board.

Automatic insurance is earned at the rate of J$65 for each 110 dry or jelly coconuts sold to the entities mentioned above.

(iii) **Contractual Insurance**

Registered coconut growers can purchase contractual insurance from the Board for their properties whether or not they supply coconuts to the Board or to licensed coconut dealers.

This information is always given during the Annual Meeting of Coconut Growers and in spite of this, growers continue to express dissatisfaction after a hurricane if they do not receive benefits.

An appeal is again being made to coconut growers to make provision for insuring their coconut trees against windstorm damage, from the sale of coconuts, either by purchasing insurance or by selling their coconuts to licensed coconut dealers or the Board to earn automatic insurance. However, the amount of insurance coverage a grower is likely to earn by way of automatic insurance alone, will never be adequate.

8. RESEARCH

The Research Department continued to work towards maintenance and improvement of the coconut industry in Jamaica, through constant monitoring and review of prevailing cultural practices, available germplasm and disease control interventions.

Botany/Plant Breeding

The Botanist/Plant Breeder continued the search for high yielding, disease resistant varieties of coconut during Year 2017. Hybridization activities were conducted at Barton Isles Seed Garden in St. Elizabeth.

The following activities were undertaken during the year:

(i) **Monitoring the Brazil Green Dwarf and its Hybrids (Brapan and Maybraz) for their potential to increase Local Coconut Production**

Figure 1 Amity New Hybrid Experiment

Brapan
(Brazil Green Dwarf x Panama Tall)

Maypan
(Malayan Dwarf x Panama Tall)

Maybraz
(Malayan Yellow Dwarf x Brazil Green Dwarf)

(ii) **Monitoring the Brazil Green Dwarf and Fifteen other Varieties introduced from the Ivory Coast, Africa in 2009 for their potential to increase Local Coconut Production**: Seven thousand five hundred (7,500) seednuts were received from the genebank in the Ivory Coast in 2009. These were planted in three variety collections and have since come into bearing. A total of 615 seednuts has been reaped to date from nine (9) of the fifteen (15) varieties and set in local nurseries, in order to increase the respective local populations. From these, 210 seedlings were obtained, which were set in one Observation Plot so far.

Immature Vegetative Data were collected at the IC2009 R1 Observation Plot at Trade Winds Citrus Company Jamaica Ltd. in Bog Walk, St. Catherine. This site represents the first local replication of the varieties introduced and are being tested under local farmers' conditions. Some seedlings from the local Thailand Tall population were also planted as fillers.

The results are summarized in Table 1.

Table 1 Trade Winds IC2009 R1 Observation Plot Immature Vegetative Data – 2017

Variety	Symbol	Number Planted	Number Alive	Survival (% of Number Planted)	Mean Girth at Soil Level (cm)	Mean Number of Leaves
Aromatic Green Dwarf	AROD	39	31	79.5	25.9 +/- 8.98	8.4 +/- 1.82
Brazil Green Dwarf	BGD	34	21	61.8	28.0 +/- 7.80	9.5 +/- 0.98
Catigan Green Dwarf	CATD	7	3	42.9	23.7 +/- 4.99	8.7 +/- 1.89
Kinabalan Green Dwarf	KIND	13	10	76.9	23.9 +/- 6.71	7.8 +/- 1.23
Palu Tall	PUT	6	4	66.7	24.8 +/- 6.41	9.0 +/- 2.12
Philipog Green Dwarf	PILD	44	33	75.0	20.7 +/- 8.07	7.3 +/- 1.89
Tacunan Green Dwarf	TACD	26	17	65.4	25.8 +/- 8.45	8.9 +/- 1.54
Tahitian Red Dwarf	TRD	5	0	0.0	N/A	N/A
Thailand Tall [Local]	MPET	49	42	85.7	36.0 +/- 11.86	9.6 +/- 1.88
Total	**-**	**223**	**161**	**72.2**	**-**	**-**
Mean	**-**	**-**	**-**	**-**	**24.7**	**8.5**
Std. Dev.	**-**	**-**	**-**	**-**	**2.28**	**0.75**

(iii) **Replication of Coconut Germplasm at the Field Genebank in Plantain Garden, St. Thomas**: The coconut is described as a recalcitrant crop, meaning that the seednuts cannot be held for long periods of time without germination. Germplasm conservation is best carried out therefore in field genebanks, which need to be renewed by replication at intervals of about 15 to 20 years.

The Field Station at Plantain Garden hosts important varieties and hybrids, and represents the major Coconut Field Genebank in the Caribbean. Some of these are very difficult to replace as they are rare. These include the Peru Tall and the Cuban Dwarf. Varieties present were collected over an extended period, the latest being the consignments from Ivory Coast in 2009 and 2012. In fact, the world's largest Coconut Field Genebank (from which many of these were sourced and could be replaced) is also now itself at risk from an outbreak of lethal yellowing disease.

Replication at Plantain Garden is now due, especially with the threat of lethal yellowing disease at this site. This replication exercise has commenced, with sib-pollination of the tall varieties and self-pollination of the dwarf varieties. A number of new field genebanks will be established from the progeny obtained.

The following measures were taken:

- Immediate moratorium on reaping of nuts for commercial purposes at this site.
- Mature (open pollinated) seednuts were reaped and set for distribution as open pollinated progeny (offspring) of the varieties present.
- Self and sib pollination of all varieties present, for their inclusion in a new Field Genebank, to be established by the Board.

Sib-Pollination was carried out on several inflorescences in the following number of trees on the varieties stated:

Variety	Sarawak Tall [SKT]	Kar Kar Tall [KKT]	Markham Valley Tall [MVT]	Fiji-Malayan Orange Dwarf [FMOD]
Number of Trees	8	10	3	8

Self-pollination was also carried out on 24 palms of the Brazil Green Dwarf (BGD) and 6 palms of the Catigan Green Dwarf (CATD) variety.

Open-pollinated seednuts were also reaped and set from the following varieties:

Fiji-Malayan Orange Dwarf (FMOD)	112
Sarawak Tall (SKT)	77
Kar Kar Tall (KKT)	58

(iv) **Mitigation of Lethal Yellowing Outbreak at Plantain Garden Seed Garden**: Lethal yellowing disease first appeared at Plantain Garden Seed Garden circa ten years ago with three cases observed among Cuban Dwarfs. These were immediately felled and there were no further cases observed, until the outbreak in late 2016. In fact, no cases were observed in the general community of Sunning Hill over the years.

Control interventions employed included prompt removal of the affected palms at the seed garden, as well as those at a neighbouring farm and the general community of Sunning Hill.

This has prevented the disease occurrence from entering the explosive phase at this site. The progress of the disease during the year is illustrated below as number of palms felled by month:

Month	**No. of LY affected palms felled**
January	9
March	22
April	7
May	21
August	19
September	6
October	28
November	9
December	5
TOTAL	**126**

(v) **Assessment of Germination at the Board's Nurseries**: The Board operates four nurseries, one each in St. Thomas, St. Mary, Portland and St. Elizabeth, where coconut seedlings are produced for distribution to farmers. The monitoring of germination levels and ultimately seedling yield has been a useful, ongoing exercise.

It should be noted that the computations involve the number of seedlings present at the 'ready' stage expressed as a percentage of total seednuts set. It is, in reality, an assessment of seedling yield, as seedlings which die after germination are not computed.

Results

Germination of individual classes of seednuts was assessed across nurseries as illustrated in Fig. 1 and Table 2.

Mean germination percentages are computed in seedbeds at each nursery that are adjudged to be "ready" (for distribution), on a monthly basis. The results are ranked by class of seednut (variety and source) and nursery. The results from previous years (2003, 2010 and 2012 – 2016) are displayed in Table 1 and illustrated in Fig. 1. The raw data for 2017 (year-to-date) are displayed in Table 2.

Fig. 1 Mean Percentage Germination at CIB Nurseries for 2003, 2010, 2012 -2017

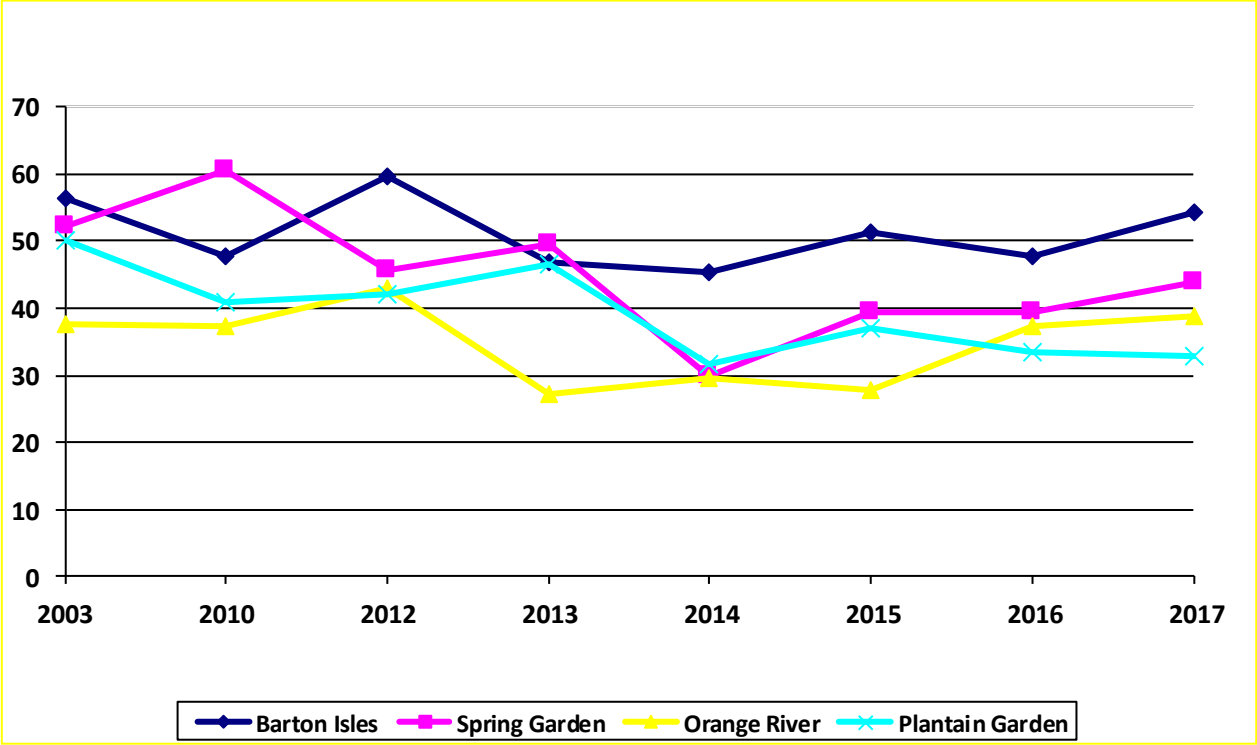


Table 2 Mean Percentage Germination at CIB Nurseries for 2003, 2010, 2012 -2017

	2003	2010	2012	2013	2014	2015	2016	2017	Mean [1]	Std.Dev.
Barton Isles										
Maypan ex Barton Isles	55.0	44.3	59.8	47.0	48.4	51.2	52.3	59.1	**52.1**	5.6
Maypan ex Esher	-	-	-	-	42.5	-	-	-	**42.5**	
Brapan[2]							46.3	57.9	**52.1**	8.2
Malayan Dwarf	57.5	51.0	-	-	-	-	45.1	46.1	**49.9**	4.9
Mean [3]	**56.3**	**47.7**	**59.8**	**47**	**45.4**	**51.2**	**47.9**	**54.4**	**51.2**	**5.2**
Spring Garden										
Maypan ex Barton Isles	44.5	63.5	-	54.1	38.4	43.9	44.2	47.6	**48.0**	8.3
Maypan ex Esher	-	-	30.9	48.1	23.4	37.2	38.3	24.2	**33.7**	9.4
Brapan							27.7	57.8	**42.8**	15.1
Maypan ex Black	-	-	49.8	54.4	-	-	-	-	**52.1**	2.30
Malayan Dwarf	60.0	57.8	56.4	41.7	22.1	37.5	47.1	45.9	**46.1**	12.6
Mean	**52.3**	**60.7**	**45.7**	**49.6**	**30.0**	**39.5**	**39.3**	**43.9**	**45.1**	**9.3**
Orange River										
Maypan ex Barton Isles	37.5	39.9	40.8	12.4	29.9	34.3	45.1	45.2	**35.6**	10.7
Maypan ex Esher	-	35.6	39.0	25.6	33.4	21.1	33.4	38.8	**32.4**	6.7
Maypan ex Black	-	-	48.4	-	-	-	-	-		
Brapan							45.8	37.3	**41.6**	4.3
Malayan Dwarf	-	36.5	43.4	43.9	25.4	28.0	25.2	33.9	**33.8**	8.0
Mean	**37.5**	**37.3**	**42.9**	**27.3**	**29.6**	**27.8**	**37.4**	**38.8**	**34.8**	**5.8**
Plantain Garden										
Maypan ex Barton Isles	47.0	-	-	-	31.4	37.7	33.6	44.5	**38.8**	6.0
Maypan ex Black	-	38.0	50.1	49.8	-	-	-	-	**46.0**	5.63
Malayan Dwarf	53.0	43.8	34.2	43.6	31.6	36.2	33.2	32.7	**38.5**	7.5
Brapan	-	-	-	-	-	-	-	50.6	**50.6**	
Mean	**50.0**	**40.9**	**42.2**	**46.7**	**31.5**	**37.0**	**33.4**	**42.6**	**40.5**	**6.3**

[1] Mean for class of seednut
[2] All Brapans are produced at Barton Isles
[3] Annual mean for nursery

Pathology

(i) **Lethal yellowing disease**: Lethal Yellowing (LY) continued to be a devastating disease that affects coconut and more than 35 other palm species in the Americas. In Jamaica, LY disease remained active in the major coconut growing areas and continued to threaten the viability of the local coconut industry by destroying varieties and hybrids grown locally.

Research efforts focused on assessing the only resistant group of plants called "Special Malayan Dwarf Yellows" in curtailing the spread of the disease.

LY management strategies to reduce spread of the disease were promoted:

These were:

- Planting several varieties and hybrids in one place (Figure 1)
- Removal and burning of infected trees immediately
- Replacement of infected trees immediately
- Removal of alternate/alternative host plants
- Planting other susceptible palms as indicator plants in fields and around the boundary of fields

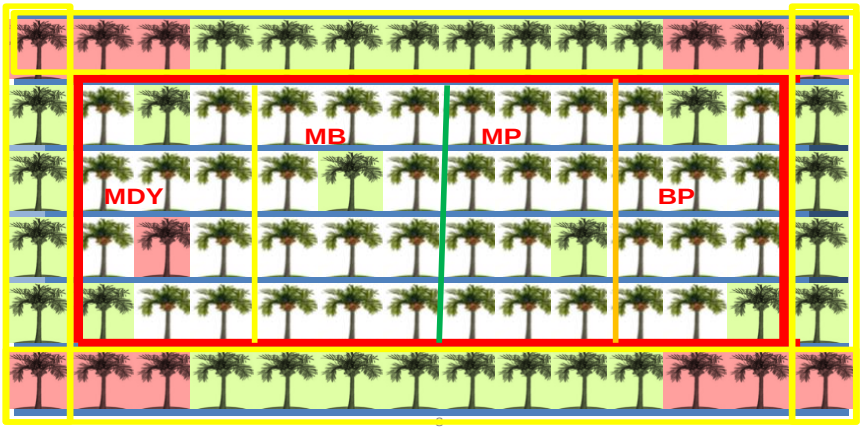


Figure 1 Multi-varietal plantings with MDY (Malayan Dwarf Yellow), MB (Maybraz), MP (Maypan) and BP (Brapan)

(ii) **Production of "Special Malayan Dwarf Yellows" (F_1) at Barton Isles, St. Elizabeth**: The 'true to type' Malayan Dwarf Yellows at Barton Isles, St. Elizabeth, produced 1,285 seednuts to date. Seven hundred and eighty-three (783) seedlings representing 60% were germinated in the nursery. Ninety-six percent (96%) of these seedlings were distributed to farmers.

(a) Approximately two hundred and forty-seven (247) "Special Malayan Dwarf Yellows" located at Spring Garden, Portland, were monitored in 2017, none of which has succumbed to the LY disease.

(b) The experimental plot (exposing the 'Special' Malayan Dwarf plants to the lethal yellowing disease) established at Hon. F. M. Phipps' farm in Union, St. Mary, was monitored and found to be LY free.

The experiment consists of 15 'Special' Malayan Dwarfs and 15 Malayan Dwarf Greens.

(c) The experimental plots with the 'Special' Malayan Dwarf Yellows at Amity Hall, St. Thomas were monitored for pests and diseases in 2017 and found to be pest and disease free.

(d) Seminars on pests and diseases of coconut were conducted in areas in St. Mary, St. Catherine and at the Board by the Plant Pathologist. Brochures were given out in affected and unaffected areas and posters were placed at strategic locations.

(e) One Thousand one hundred and sixty (1,160) nuts previously harvested from the 'Special' Malayan Dwarfs were placed in the nursery at Spring Garden, Portland during 2017.

(iii) **Bud rot disease**: Measures were implemented for the control of bud rot disease in coconut growing areas.

(iv) **Ambrosia beetle**: During 2017, the Ambrosia beetle was identified in two new areas, namely, Esher in St. Mary and Kildare in Portland, where control measures for the spread of the beetle were successfully implemented.

The Board continued to monitor the other 14 areas in which the beetle was previously identified:

St. Mary	Portland	St. Thomas	Other Parishes
Pemberton Valley	Lennox	Nutts River	Hayes, Clarendon
Orange River	Rose Garden	Bachelors Hall	Ramble, Hanover
Highgate	Hopewelll		Barton Isles, St. Elizabeth
Nashville			
Crescent			
Harmony Hall			

(v) **Nutts River Farm**: Fifty-nine (59) LY diseased trees were identified at Nutts River Farm, Needham Pen in St. Thomas and removed in 2017. There was an outbreak of lethal yellowing disease in the Needham Pen area in 2017, which was successfully controlled by the Board's Lethal Yellowing Tree Cutting Team which felled LY trees on Nutts River Farm and the surrounding properties.

(vi) **Observation of Seedlings planted with and without roots**: The primary objective of this experiment , which was completed in 2017, was to assess the rate of growth of two sets of coconut seedlings in batches of ten plants each over nineteen months. The plants were assessed at three periodic intervals, firstly at six (6) months, secondly at fifteen (15) months and finally at nineteen (19) months, respectively. The first set was planted with roots and the other set without roots. Following the agronomic evaluation and statistical assessment, the results were analysed and inferences were made.

In the first group, those with roots, the rate of growth throughout all observation periods showed a wider variation in height than those without roots. On the other hand, plants without roots showed an increasing trend in growth rate in all three periods.

Regarding the girth of each set of plants, there was no notable variation in the rate of growth of both groups at six months. However, during the 15th and 19th months it was observed that plants without roots showed a greater growth rate than those with roots.

(vii) **The Caribbean Coconut Development Project**: The application of the Integrated Pest Management (IPM) approach was used in coconuts in three farms involving three pests: Gall mites, LY Phytoplasma and Ambrosia beetle.

The following farms in Table 1 were selected:

Table 1 Farms selected for IPM strategies

Farmer	Location of farm	Parish	Pest/Disease	Scientific name
Andrew Simpson	Ballards Valley	St. Mary	Gall Mites	*Aceria guerreronis* Keifer
Dudley Coombs	Annotto Bay	St. Mary	Lethal yellowing	*Candidatus Phytoplasma palmae*
Hon. A.A. Pottinger	Nashville, Highgate	St. Mary	Ambrosia beetle	*Xyleborus ferrugineus*

Weed samples were collected from the LY plot at Annotto Bay, St. Mary and were identified by Mr. Lewis, a Weed Scientist at the University of the West Indies. A list of weeds found at lethal yellowing infected sites in Jamaica is being compiled.

The following weeds were dominant in one lethal yellowing plot:

(1) ASTERACEAE (COMPOSITAE) *Wedelia trilobata* “creeping Ox-eye”, “Marigold”
(2) LAMIACEAE (LABIATAE) *Hyptis verticillata* “John Charles”
(3) CONVOLVULACEAE *Ipomoea setifera* “vine”

(viii) **Quality of coconut water in Jamaica**: In November 2017, a conference on the quality and safety of coconut water initiated by the Plant Pathologist and implemented by CARDI/ITC, with support from the Coconut Industry Board, was successfully concluded with recommendations to address the quality of the coconut water in the region.

In December, the quality of coconut water and the CARICOM Regional Organisation for Standards and Quality (CROSQ) were discussed at a meeting at CARDI, Jamaica. The objective of the standard is to promote efficiency and competitive production in goods and services, through the process of standardization and the verification of quality. In this regard, CROSQ aims to support international competitiveness for the enhancement of social and economic development of the region.

(ix) **Spring Garden nursery in Portland**: A project to raise the seedbeds at Spring Garden Nursery in Portland commenced in 2017. Three beds were completed successfully during the year for protection from flooding. The remaining beds will be raised and proper drainage constructed during the subsequent year.

(x) **Nursery for Knockalva School**: Preparation has started for a coconut nursery to be established at the Knockalva School in the parish of Hanover.

(xi) **Documents for CARDI/ITC Project**:

(a) A draft document on the effective pathological risk mitigation measure for the Caribbean was prepared.

(b) "Coconut palm pests and disease surveillance and emergency plan for the Caribbean and Lethal Yellowing and Bud Rot Pest Surveillance and Emergency Plan" was written by the Plant Pathologist for the CARDI/ITC project.

(xii) **Tropicsafe – The 2020 Horizon Funding**: A consortium of scientists applied under the 2014-2020 Horizon research and innovation framework programme, for funding to conduct research on insect-borne prokaryotic-associated diseases in tropical and subtropical perennial crops. The proposal of the consortium was selected from among thirteen other proposals seeking funding by the European Union (EU). Jamaica (CIB) was granted 110, 000 Euros. All the preparatory work to facilitate inception of the project was completed:

(a) All documentation needed by the project has been submitted
(b) Project Coordinator visited Jamaica for project related activities

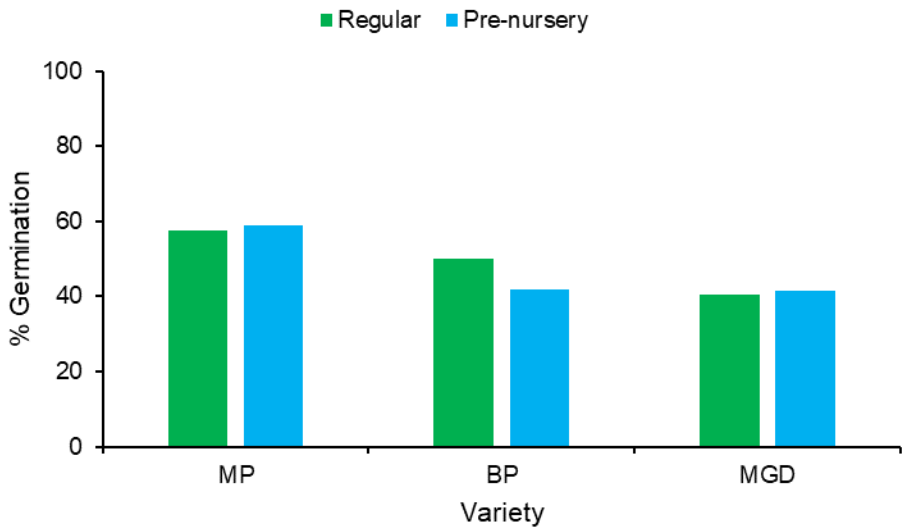
Agronomy

The Agronomist/Crop Physiologist focused on research aimed at improving germination in coconut seeds and increasing production of seednuts during 2017.

(i) **The establishment of pre-nurseries to allow for uniformity of growth for seedlings grown in the nurseries**: Historically, coconut breeding facilities have found it challenging to achieve high rates of germination. As a result, a number of growers tend to buy seedlings at a certain growth stage and transplant. However, producers of seeds consistently try to produce their own seedlings and, as such, many have created pre-nurseries which are believed to result in a higher germination percentage. Under pre-nursery conditions, seeds are placed in a cool and suitable environment that allows for germination and will remain in that position for a few months (sometimes 4 months, or up to the 3-4 leaf stage). The seedlings, now autotrophs, are transferred to the nursery, and within a given period, which can last for a few more months, they are transplanted into the fields (CIRAD, 2008).

At the Board, conventional methods dictate that harvested seeds are set directly into the nursery, where they remain for approximately 6 months then are transplanted into the field. Germination achieved over the years tends to range between 40% and 60%. As a result, a "first-stage" pre-nursery was established at one of our locations using three varieties, with some modifications to normal practices. Seeds were left in a cool place and when sprouted were transferred to the nurseries where they were kept up to six months before being transplanted in the fields.

Figure 1 Germination percentage for seeds set using pre-nursery and conventional methods



MP – Maypan; **BP** – Brapan; **MGD** – Malayan Green Dwarf

Results gathered from this experiment indicated that there were no differences in the number of seeds that germinated under pre-nursery conditions when compared to the conventional methods used.

(ii) **Establishment of an additional nursery to produce quality seedlings**: A nursery with an annual capacity of 26,752 seeds was established at Esher, St. Mary, for the production of coconut seedlings to be distributed to farmers. This will allow for the availability of an increased number of seedlings to farmers in the eastern parishes.

(iii) **Vermicomposting**: Vermicomposting is one of the biological methods of converting organic materials into nutrient rich fertilizer and soil conditioner. Vermicompost, according to Lim et al (2014), is physically, nutritionally and biochemically improved over traditional compost. The Agronomist established a vermicomposting experiment in which shredded coconut husks were used as the bedding material for red wrigglers. Horse manure was also added to the compost bin.

Upon the completion of the vermicomposting process, efforts were made to test the experimental media. Locally produced red peas were planted using 12 different media, or combinations thereof (including soil) in a randomized block design experiment. Red peas were selected because they are easy to grow and will give results much sooner than coconuts, as well as they produce nodules which will be an indication of the presence/absence of nitrogen within each of the media. A number of determinations to include height, number of leaves was collected, and later, assessments of the reproductive features will be recorded. Treatment using the coconut husk with horse manure, coconut husk with horse manure and one soil type (from St. Mary), as well as the vermicompost showed the best results.

At the start of the experiment, a sample of the shredded material was sent to the laboratory at the Agricultural Land Management Division of the Ministry of Industry, Commerce, Agriculture and Fisheries, for analytical assessments. Results showed that coconut husks used in this experiment had low percentages of calcium and magnesium, moderate amounts of phosphates, and high levels of potash. Since the

completion of the vermicomposting process, samples for each of the different media were sent to Water Agricultural Laboratories, Inc., Georgia, U.S.A., in partnership with Hi-Pro Farm Supplies. Results indicated that the pH of the vermicompost (7.1) was very comparable to that of the soils (7.3) tested.

(iv) **Fertilizer trial**: The comparison of the performance of two fertilizers supplied by Sapphire Agriculture of Jamaica and Newport Fersan Jamaica Ltd. was conducted to determine the effects each would have on growth and development of coconut plants.

The graph below shows the effects of the fertilizer, and so far, no differences were seen (Figure 2). The experiment is however, still in its infancy.

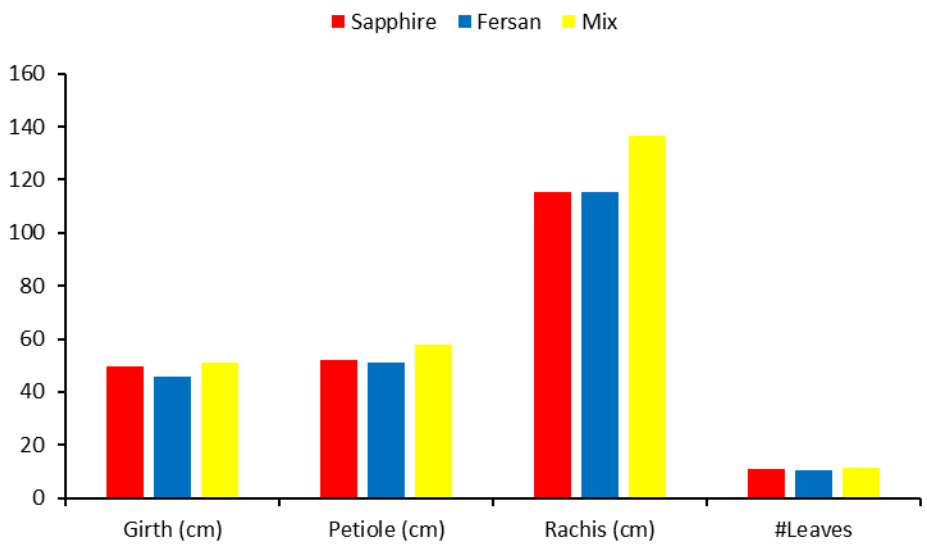


Figure 2

(v) **Efforts to mitigate soil erosion at Esher**: The planting of grass with extensive root system and the construction of rock-filled gabion baskets to help to mitigate soil erosion in sections of Esher in St. Mary continued during 2017.

(vi) **To determine the effects of mother palms on germination**: The quality of coconut seedlings produced is believed to be impacted by the genotype, and physiology of the mother palms. As a result, sixty-nine trees were selected on one of the Board's seed gardens, based on some of the well-known characteristics of a good mother palm. When harvested, the seeds were set in nursery beds, observations made and the germination percentages noted. To date, 860 seed nuts were harvested with an approximated 49% germination. These upcoming seedlings will be transplanted and their growth and development monitored over a given period.

References

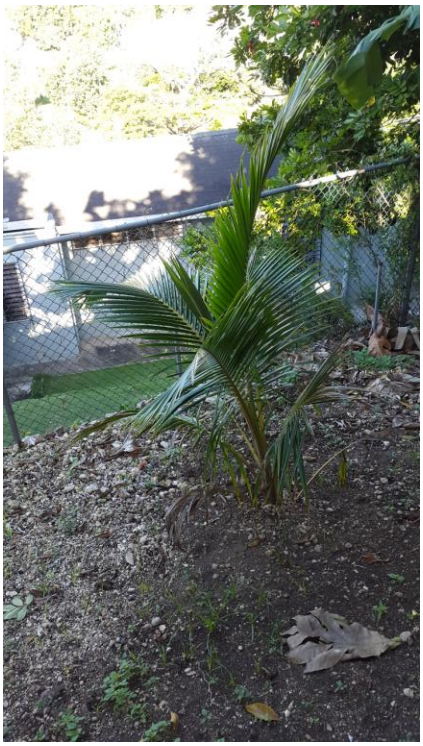
CIRAD. 2008. “Germinated oil palm seeds. Recommendations for prenursery and nursery management.”

Lim, Su Lin, Ta Yeong Wu, Pei Nie Lim, and Katrina Pui Yee Shak. 2015. “The use of vermicompost in organic farming: overview, effects on soil and economics.” *Journal of the Science of Food and Agriculture* 95: 1143-1156.

Coconut Tissue Culture

The Board in collaboration with the University of the West Indies continued to establish protocols for the culture of elite germplasm. During Year 2017, twenty cultured plants were hardened. A new study was initiated to test the capabilities and performance of different varieties in both callus and embryo culture. The Brazilian Green Dwarf was placed in culture in addition to the Malayan Green Dwarf and the Maypan hybrid. The performance of these varieties and others, including the ‘Special’ Malayan Dwarf were assessed. Work continued in the development of a multiplication protocol for coconuts using the hormones 2,4d and TDZ during 2017.

Below are one-year-old tissue culture coconuts planted in December 2016.



St. Mary

Portland

9. ADVISORY

During Year 2017, the Advisory Department continued its annual mandate to effectively achieve the goals of the Research Department. The Advisory Officers worked relentlessly to communicate information as well as offer technical support and act as liaison between the Coconut Industry Board and new and existing coconut growers islandwide and to the public.

(i) **Lethal Yellowing**: The lethal yellowing (LY) sensitization programme continued and was used as a means of informing and educating growers and other individuals of the spread of LY disease and measures that can be employed to restrict its spread. Officers of the department were also very active in assisting growers to remove and burn over 4,752 LY diseased trees and also provided growers with seedlings for replacement.

During the year, islandwide public awareness, education and outreach activities continued in areas where the LY disease was active. These were accomplished mainly by conducting regular farm visits, field days, staging displays at agricultural shows and various commodity boards' expositions and other group assemblies. These initiatives were achieved using different forms of communication including multimedia presentations, displays, 4-H Achievement Days, brochures, practical demonstrations and individual discussions.

(ii) **Farm Visits**: Over 2,134 regular farm visits were made to new, existing and potential growers to provide technical assistance, support and to circulate relevant information. The growers' problems and concerns were addressed individually or in groups, depending on the nature of the concerns and number of individuals with similar issues. More serious concerns or information/data gathered from farmers were likewise passed on to the Research Department for further investigations.

(iii) **Other Advisory Activities**:

- Field Days were conducted in Plantain Garden, St. Thomas and Reach Primary School in Portland.

- Displays mounted at events islandwide included:

  - ✓ Hague Agricultural Show in Trelawny
  - ✓ St. Mary Agricultural Show
  - ✓ Denbigh Agriculture and Industrial Show in Clarendon

- Participation in the following:

  - ✓ Discussions with farmers, Board Directors and personnel from the Rural Agricultural Development Authority (RADA) at the Anglican Church Hall in St. Mary and Portland
  - ✓ Workshop with the Caribbean Agricultural Research and Development Institute (CARDI)
  - ✓ Training session for enumerators under the Board's development project hosted by the International Trade Centre (ITC), European Commission (EC), Asian and Pacific Coconut Community (APCC) and CARDI at the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF)
  - ✓ ITC and CARDI survey in St. Thomas, St. Mary and Trelawny
  - ✓ Frosty Pod seminar at MICAF

10. REMUNERATION

(a) The total remuneration of the three most senior executives for Year 2017 was $17,692,293.

(b) The total fees paid to the Chairman and the other Directors (Board Members) during the year was $3,600,595 and the total fees paid to non-directors for attending Board and Committee meetings was $49,554.

These fees are in accordance with the guidelines established by the Public Enterprises Division of the Ministry of Finance and the Public Service and were approved by our portfolio Minister.

11. FINANCE

Audited financial statements for the Board and the Windstorm Insurance Fund, for the year ended December 31, 2017, are attached.

12. ACKNOWLEDGEMENT

The Board gratefully acknowledges the assistance provided by the following persons and local and overseas institutions: the Minister of Industry, Commerce, Agriculture and Fisheries and the officers of that Ministry, the Molecular Biology Unit at the University of the West Indies (**U.W.I.**), the Food and Agriculture Organisation (**F.A.O.**) of the United Nations, Rothamsted Experimental Station in the United Kingdom, the Centre for International Agronomic Research and Development (**CIRAD**), the International Coconut Genetic Resources Network/the International Plant Genetic Resources Institute (**COGENT/IPGRI**), Centro de Investigacion Cientifica de Yucatan (**CICY**) - Mexico, the Escuela Agricola Panamericana (Zamorano) - Honduras, and the University of Florida, the Asian and Pacific Coconut Community (**APCC**), the International Trade Centre (**ITC**), European Union (**EU**) and the Caribbean Agricultural Research and Development Institute (**CARDI**).

The Board expresses thanks to coconut growers for their support and to the staff of the Board for their dedication to duty.

By Order of the Board
Christopher Gentles
Chairman

TABLE I

COCONUT PRODUCTION & CONSUMPTION

PRODUCTION

	2017		2016	
	1,000 Nuts	%	1,000 Nuts	%
Parish				
St. Thomas	33	3.3	45	4.5
Portland	29	2.9	56	5.6
St. Mary	667	66.4	456	45.2
St. Catherine	116	11.6	318	31.6
St. Elizabeth	156	15.6	131	13.0
Others	2	0.2	1	0.1
	1,003	100.0	1,007	100.0
Dry & Water Coconuts (est.)	99,058		98,158	
	100,061		99,165	

CONSUMPTION

Seed Coconuts - Local	162	0.2	122	0.1
Seed Coconuts - Export	46	-	33	-
Dry and Water Coconuts	99,853	99.8	99,010	99.9
	100,061	100.0	99,165	100.0

TABLE II

DISPOSAL OF COCONUTS DELIVERED BY GROWERS

	2017 Units	2016 Units
Exported as seed	387	303
Used locally for seed, jelly coconuts, etc.	34,708	15,206
	35,095	15,509

TABLE III

UNITS OF COCONUTS DELIVERED BY GROWERS IN 2017

Units of Coconuts In Groups of	Growers No.	Growers %	Units Delivered No.	Units Delivered %
1 and up to 20	22	34.4	178	0.5
Over 20 " 50	10	15.6	303	0.9
" 50 " 100	8	12.5	570	1.6
" 100 " 200	11	17.2	1,556	4.4
" 200 " 500	8	12.5	2,408	6.9
" 500 " 1,000	2	3.1	1,482	4.2
" 1,000 " 5,000	2	3.1	2,673	7.6
" 5,000	1	1.6	25,925	73.9
	64	100.0	35,095	100.0

Note

One unit = 110 nuts

TABLE IV

DIRECTORS' COMPENSATION 2017

Name	Position of Director	Fees	Motor Vehicle Upkeep/ Travelling or Value of Assignment of Motor Vehicle	All Other Compensations including Non-cash Benefits as Applicable	Total
		$	$	$	$
Christopher Gentles	Board Chairman	615,000	142,774	120,000	877,774
Stephen Black	Board Member	172,800	76,328		249,128
Homer Davis	Board Member	145,800	192,841		338,641
Charles Douglas	Board Member	221,400	80,280		301,680
Sandra Ennis	Board Member	252,000	189,175		441,175
Hugh Gentles	Board Member	154,800	125,208		280,008
Granville Marsh	Board Member	273,600	98,620		372,220
Frank Phipps	Board Member	225,000	90,592		315,592
Alaric Pottinger	Board Member	255,600	168,777		424,377
	TOTAL	**2,316,000**	1,164,595	120,000	3,600,595
Raymond Mattis (Govt.Rep.)		5,400	44,154		49,554
		2,321,400	**1,208,749**	**120,000**	**3,650,149**

Note: (a) $1,208,749 – Travelling allowances
(b) $120,000 represents out-of-pocket expenses for the year