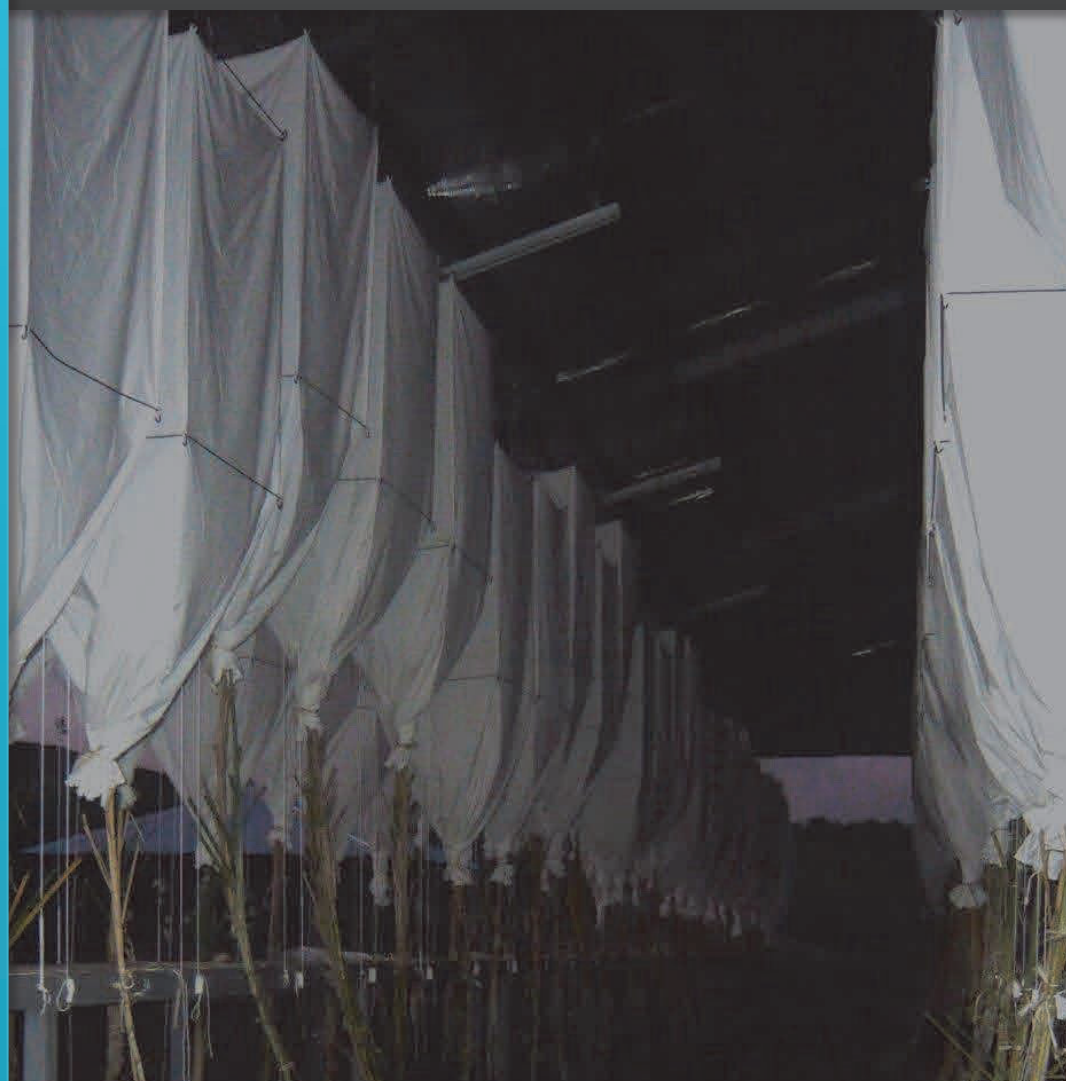


ANNUAL REPORT 2012



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SUGAR RESEARCH INSTITUTE OF FIJI



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PARLIMENT OF FIJI
PARLIMENTARY PAPER NO. 49 OF 2018

MISSION STATEMENT

To advance the industry by excellence in technology transfer emanating from research results through science that supports innovative activities in sugar related industries and to make the Fiji Sugar Industry productive and sustainable.

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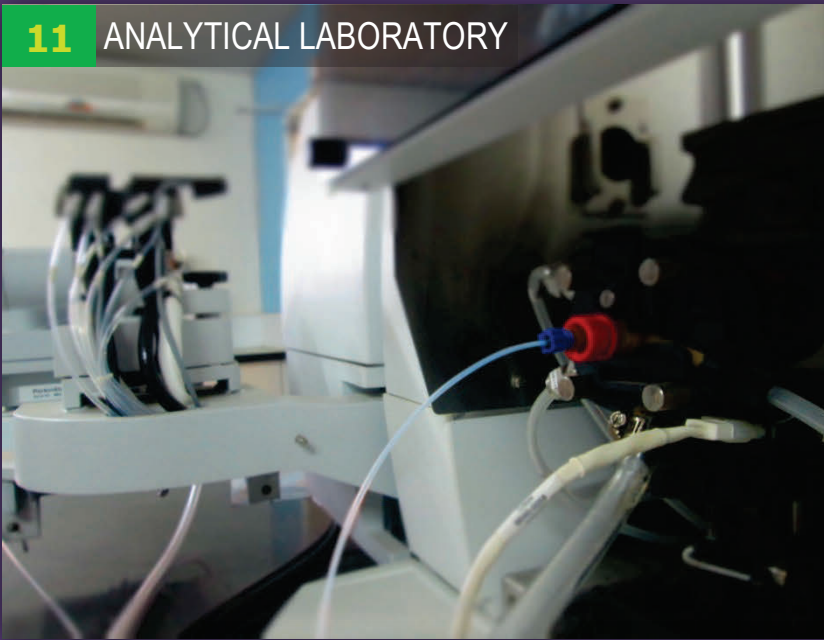
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FORWARD

The year, 2012 was a difficult one for the industry. The continuing loss of important resources, due to natural events, had a major impact on cane production, particularly a very wet period during the first three months that led to 2 major floodings of the low lying cane belt areas. The Sugar Industry Strategic plan (SAP 2012- 2022) was compiled during the year and the Institute's task under the Crop Production Program in the SAP focuses to improve production through prioritization of sugarcane research. Several key elements have been identified in the SAP that SRIF has to address through the Grower Advisory Services mechanism. The Institute consulted with all stakeholders to determine the priorities for research for long-term gains in cane and sugar production. SRIF believes that forward-looking, anticipatory research and analyses that integrate the diverse views of growers and other stakeholders on specific opportunities and challenges facing the industry will have most benefit for the industry.

During the year a new crossing shed was constructed with funds provided by the European Union. The crossing shed will provide the right environment for conventional breeding and enhance the research capacity to advance the development of new varieties. A total of 792 crosses were made in 2012. Leaf samples from 30 varieties assumed to be *Erianthus* hybrids were sent to Mauritius and Australia for DNA analysis to confirm if these varieties were true *Erianthus* hybrids. None of these varieties tested positive. An advanced variety adaptation trial was evaluated using a new concept known as large population trial. This concept was introduced to overcome difficulties encountered in weighing of individual plots for cane yield determination. This trial will continue until the 2nd ratoon is completed next year.

The analytical lab provided fertilizer recommendation for 1266 soil samples from grower's fields for planting of sugarcane and 2274 cane samples were analysed from the agronomy and plant breeding trials. The analytical laboratory participated in the SPACNET proficiency program for accreditation of the laboratory. A field audit was conducted during the year to assess post-harvest losses that revealed 2.9 and 4 tonnes cane per hectare were lost with mechanical and manual harvesting respectively. The disease control unit inspected 7,491 hectares for Fiji leaf gall disease and removed 534 stools of infected cane. The hot water seedcane nursery program produced 2,260 tonnes of seedcane but uptake of the seedcane was poor due to after effects of the flooding's that was experienced during the year. The GIS mapping of two sectors was completed in 2012 and some useful data was collected for these sectors that can be in future planning for the extension services.

I would like to thank all staff for their dedication and commitment to the institute.

Chief Executive Officer



**PARLIMENT OF FIJI
PARLIMENTARY PAPER NO. 49 OF 2018**

CROP IMPROVEMENT



ACP Project – A Comparative Study of Family and Individual Mass Selection Methods as Early Selection Criteria

50 families planted for the prototype trial were analyzed and no significant difference was found between the families for %pocs, tch and tsh which was attributed to lack of genetic diversity in crosses.

For the actual trial, 71 packets of West Indies fuzz was imported and sown of which 70 germinated. The initial count saw at least 60 families having more than 80 seedlings required for the actual project. After damage by Cat 4 TC Evan only 26 families were available for the project. The balance was sought from polycrosses. For this reason, trial planting for the project was re-scheduled to 2013.

ACP Project - Nobilization of *Erianthus*

The nobilization work continued in 2012 with samples sent to MSIRI for DNA tests on hybrids attained. No positive results were received on the hybrids. The progeny from LF2011 and LF2012 series will be tested in 2013.

Germplasm/ Breeding Plots

The maintenance of Germplasm continued in 2012. The DNA fingerprinting work was initiated in the Drasa Germplasm and 9 DNA extractions samples were sent to Mauritius Sugar Industry Research Institute - MSIRI. Unfortunately all the samples were contaminated and work on getting clean samples is ongoing.

The breeding plots were maintained and re-planting and transfer of the flowering varieties from the farmer's field to the new breeding facility was initiated. Some new additions in terms of imported varieties were done - 9 *Erianthus spp.* from Vietnam (6 germinated), 8 varieties from BSES, Australia (all germinated).

Sugarcane Crossing

A total of 792 crosses were set involving commercial crosses, experimental crosses and some outcrosses (refer to Table 1 for breakdown of crosses). All the crosses were set at the Dobuilevu breeding facility from 07/05/2012 to 04/07/2012. The new crossing shed for bi-parental crosses neared completion and was utilized to set 100 crosses.



Crosses inside the new crossing shed.

Fuzz Sowing

A total of 854 packets of fuzz were sown from 2009 - 2012 crosses of which 458 germinated giving 54% germination. This also included 71 packets of fuzz from West Indies to be used for the ACP project. The breakdown of sowing is presented in Table 2. The % germination was largely affected by poor germination of 100 lantern crosses set in the new crossing shed as a trial.

Stage 1

The LF2011 series was planted and evaluated as Stage 1 whereas LF2012 series was planted as new Stage 1. For LF2011 series, a total of 22 495 seedlings was available for transplanting however only 10 640 seedlings of which 14% were from experimental crosses were transplanted. The reduction on the seedling number is attributed to the following –

1. Only 100-200 seedlings were planted from crosses having more than 200 seedlings which is considered enough to attain variation in seedling population.
2. High seedling mortality due to delay in transplanting following heavy rainfall and water-cuts at FSC after flooding affecting routine watering.
3. Damage by Mar2011 flood in the field following transplanting.

A total of 296 clones (2%) were selected from LF2011 series the low number due to damage by TC Evan. For LF2012 series, approximately 26,000 seedlings were available including the seedlings from West Indies fuzz at the beginning of the season. However, these were damaged by TC Evan as well following which, approximately 6889 was planted for Stage 1 whereas 2000 was set aside for ACP Family trial.

Stage 2

In 2012, LF2010 series was evaluated and LF2011 series was planted. A total of 1 144 clones were in LF2010 Stage 2 of which 297 were selected for biochemical analysis based upon field brix and field grading on characteristics like trashing, growth habit, lodging, disease symptoms. A final selection of 64 varieties was made based on %pocs and %fibre and planted as Stage 3. A total of 296 clones were planted for LF2011 Stage 1 trial and will be evaluated in 2013.

Stage 3

LF2009 series was evaluated and LF2010 series planted. LF2009 series had 141 varieties of which 50% did not germinate well due to seed cane issues. After field evaluations, 61 varieties were sampled, 14 were selected and propagated for Stage 4 trial. A total of 64 varieties were selected from LF2010 series Stage 2 and planted as LF2010 Stage 3.

Table 1: Breakdown of crosses set at Dobuilevu Breeding Facility in 2012.

Type of cross		No. of cross	%	Total per type	% per type
Commercial	Poly crosses	236	30	351	44
	Bi-parental	15	2		
	Bi-parental - lantern	100	13		
Experimental	Erianthus - lantern	7	1	181	23
	Erianthus	49	6		
	IJ/IK Hybrids	51	6		
	Officinarum	60	8		
	KT/BT	13	2		
	JRP	1	0.1		
Backcrosses	Erianthus Hybrids	169	21	260	33
	Robustum hybrids	91	11		
Total Crosses		792	100	792	100

Table 2: Details of fuzz sowing carried out in 2012 – fuzz from year 2009 - 2012

Year	Details	Commercial crosses				Experimental crosses							Outcrosses		Total
		Poly	Bi-parental	West Indies	Lantern	Robustum	Erianthus	Erianthus Lantern	IJ/IK hybrids	Officinarum	KT/BT	JRP	Erianthus hybrids	Robustum hybrids	
2009	Sown	95	28		-	2	15	-	-	-	-	-	-	-	140
	Germ	39	3		-	2	4	-	-	-	-	-	-	-	48
	%	41	11		-	-	27	-	-	-	-	-	-	-	34
2010	Sown	128	6		-	2	12	-	11	-	-	-	-	-	159
	Germ	90	5		-	1	11	-	8	-	-	-	-	-	115
	%	70	83		-	50	92	-	73	-	-	-	-	-	72
2011	Sown	92	3		-	2	-	-	69	51	-	-	4	2	223
	Germ	58	2		-	2	-	-	45	27	-	-	3	0	137
	%	63	67		-	100	-	-	65	53	-	-	75	0	61
2012	Sown	81	3	71	103	-	3	5	22	10	6	1	4	23	332
	Germ	52	1	70	3	-	0	1	10	4	5	1	1	10	158
	%	64	33	99	3	-	0	20	45	40	83	100	25	43	48
Total	Sown	396	40	71	103	6	30	5	102	61	6	1	8	25	854
	Germ	239	11	70	3	5	15	1	63	31	5	1	4	10	458
	%	60	28	99	3	83	50	20	62	51	83	100	50	40	54

Table 3 below shows the results of plant and 1st ratoon crop from LF2006 series. The trial was planted in Drasa and Rarawai. Both trials are in 2nd ratoon and will be evaluated in October 2013.

Table 3: LF2006 Series (Evaluation of 1st Ratoon)

Varieties	tch	tsh	%pocs	%fibre
LF91-1925	154	20.66	14.04	11.61
Mana	126	15.98	13.71	9.81
Naidiri	132	19.95	15.31	11.09
Ragnar	88	12.79	15.05	11.86
Test Varieties				
LF06-525	143	20.26	14.75	11.30
LF06-529	140	20.29	15.10	11.35
LF06-591	138	19.31	14.64	12.09
LF06-320	134	18.50	14.23	12.95
LF06-336	133	17.81	14.09	12.89
LF06-566	127	17.01	14.08	12.31
LF06-165	126	17.13	13.99	14.38
LF06-353	123	17.43	14.93	9.61
LF06-426	121	16.80	14.45	10.70
LF06-372	115	17.33	14.93	12.45
LF06-499	113	16.35	14.93	10.19
LF06-539	112	16.00	14.86	10.96
LF06-433	100	14.31	13.99	12.03
LF06-381	100	13.71	14.55	11.56

Table 4: LF2007 Series (Evaluation of Plant)

Variety	tch	tsh	%pocs	%fibre
Naidiri	90	14.68	16.2	11.33
Kaba	76	11.26	14.98	11.47
Mana	71	10.82	15.23	10.34
Ragnar	59	8.57	15.9	11.39
Test Varieties				
LF07-79	107	16.93	15.73	13.07
LF99-1254	100	15.99	16.34	11.12
LF00-631	100	15.29	15.42	10.44
LF07-117	98	14.45	14.82	11.86
LF07-156	98	15.35	15.56	12.64
LF07-148	95	15.63	16.19	12.49
LF07-397	95	15.78	16.63	12.78
LF99-1126	92	14.65	15.91	11.28
LF00-1057	92	14.01	15.35	11.19
LF07-168	91	14.20	15.74	12.36
LF07-169	90	13.35	14.87	14.17
LF00-491	90	14.02	15.52	11.83
LF07-157	89	12.64	14.20	11.85
LF07-83	88	13.65	15.81	12.19
LF07-124	85	13.23	15.47	12.12
LF07-126	83	12.08	14.75	11.25
LF07-112	80	12.27	15.56	11.24
LF07-81	80	11.63	14.86	11.12
LF07-90	79	11.81	15.17	11.78
LF07-104	76	11.76	15.51	11.96
LF07-488	76	12.33	16.20	11.39
LF07-671	72	11.32	16.19	11.15
LF07-99	71	10.84	15.05	11.73
LF07-669	64	9.09	14.60	10.83
LF07-504	61	10.07	16.24	10.87

Table 4 above shows the results of plant from LF2007 series. The trial has 25 test varieties and was planted in Lautoka, Rarawai, Penang and Labasa. The trials were planted in May and June 2011. All the trials are in first ratoon and will be evaluated in October 2013.

LF2008 Series (Plant)

Eighteen varieties from LF2008 series were planted in Lautoka, Rarawai, Penang and Labasa. The trials were planted in May and June 2012. The plant crop will be evaluated between August and September in 2013.

Large Population Stage 4 Trial (LF2006 Series)

Introduction

The large population trial was introduced in 2008 and the LF2006 series varieties were the second of the trials planted under this concept. The concept of the large plot trials is to hasten the variety evaluation and reduce the time by fast tracking any promising varieties and forego the stage 5 evaluation. Under the large plot concept the idea is to plant one trial on a poor

soil that could be mechanically harvested and weighed at the mill weighbridge so that an improved assessment of the yield could be obtained. Promising varieties identified from the plant crop could be evaluated in subsequent years on different soil types and topographies at the mills. It was also presumed that varieties that would perform well on poor fertility soils would also perform well on fertile soils.

Results and Discussion

This trial was planted in May 2010 at Legalega Research Station. There were 14 test varieties and two standards (Mana and Kiuva). These varieties were planted in multiple long rows. The stand of the first ratoon crop was not healthy and this is attributed to leaching of the fertilizers due to frequent heavy rains during active growing period. In addition weed control was a problem as the weedicides applied were washed away and not very effective. The total rainfall received for the trial from October 2011 to October 2012 was 3419 mm over 166 days. The cane rows of each variety were divided into four replicates and small mill cane samples were harvested from all the varieties. Each variety was mechanically harvested and weighed at the mill weighbridge. The cane was 12 months old at the time of harvest and in the first ratoon crop.

The results of this trial are presented in table 5. Based on the result, three varieties LF06-539, 353 and 591 produced better cane and sugar yield compared to the standard varieties Mana and Kiuva. The fibre percent of five test varieties (LF06-165, 320, 336, 381 and 566) were high and ranged between 14.2 to 16.3% but the sugar yield of these varieties were below the standards. The plant and ratoon cane and sugar yield data is presented in table 6. From the data the three varieties LF06-539, 353 and 591 that performed well in the first ratoon crop also performed well in the plant crop. LF06-539 had the best cane and sugar yield in both the plant and first ratoon crop. The trial will be further evaluated in the second ratoon crop before any promising varieties can be confirmed and after verification of data obtained for the same series trials that were planted at Drasa and Rarawai.

Table 5: Cane and sugar yields first ratoon crop

Variety	plot area m ²	plot yield tonnes	tch	%pocs	%fibre	tsh
LF06-433	1079.6	5.32	49	14.1	12.5	7.0
LF06-499	1142.3	3.12	27	14.6	11.2	4.0
LF06-529	897.9	4.69	52	13.5	11.7	7.1
LF06-539	622.0	5.18	83	15.6	11.6	13.0
LF06-525	622.0	1.29	21	13.0	13.4	2.7
LF06-336	622.0	1.29	21	10.8	15.8	2.2
LF06-372	622.0	3.06	49	12.4	13.6	6.1
LF06-165	622.0	3.06	49	13.8	15.4	6.8
LF06-566	622.0	3.06	49	13.4	14.2	6.6
LF06-320	622.0	1.33	21	14.0	16.3	3.0
LF06-381	622.0	1.33	21	14.1	16.2	3.0
LF06-353	622.0	5.34	86	14.1	14.1	12.1
LF06-591	622.0	4.56	73	14.7	10.8	10.8
LF06-426	622.0	1.82	29	12.3	13.4	3.6
Mana	622.0	4.56	73	12.9	12.8	9.5
Kiuva	622.0	4.77	77	12.4	11.7	9.5
LF04-448	622.0	4.77	77	13.0	12.0	9.9

Table 6: Comparative plant and ratoon cane and sugar yield data					
Variety	cane yield		sugar yield		Comments
	P	R	P	R	
LF06-433	46	49	7.8	7.0	P & R cane and sugar yields below standards
LF06-499	44	27	7.2	4.0	Poor ratooning
LF06-529	75	52	12.3	7.1	P & R cane and sugar yields below standards
LF06-539	101	83	16.8	13.0	P & R cane and sugar yields above standards
LF06-525	40	21	7.3	2.7	Poor ratooning
LF06-336	69	21	11.1	2.2	Poor ratooning
LF06-372	51	49	8.1	6.1	P & R cane and sugar yields below standards
LF06-165	47	49	7.0	6.8	P & R cane and sugar yields below standards
LF06-566	55	49	7.9	6.6	P & R cane and sugar yields below standards
LF06-320	62	21	9.7	3.0	Poor ratooning
LF06-381	58	21	9.5	3.0	Poor ratooning
LF06-353	78	86	12.7	12.1	P & R cane and sugar yields on par with standards
LF06-591	61	73	8.8	10.8	R cane and sugar yields improved and above standards
LF06-426	60	29	7.5	3.6	Poor ratooning
Mana	94	73	15.0	9.5	Average stand
Kiuva	83	77	12.8	9.5	Average stand
LF04-448	91	77	14.7	9.9	Average stand

Tissue Culture Lab

Tissue culture is a routine project which involves media preparation, aseptic callus culture, shoot initiation and root initiation cultures. Work was done on callus culture and some work was started on meristem culture. 772 cultures of varieties such as Kaba, Naidiri, Kiuva, LF91-1925 and LF94-694 were carried out. Kiuva failed to produce callus under culture conditions while 210 variants were produced from the remaining varieties. Mortality rate for the seedlings was high due to the intense winds during the cyclone in the absence of a glasshouse. The remaining cultures in the lab also suffered due to power cuts during the cyclone. Work on meristem culture to produce disease free seedlings was initiated successfully and will be continued next year.

Biotechnology Lab

In 2012, 30 samples were sent to BSES to be verified as Erianthus hybrids. These were sent as dried leaf samples in calcium chloride. 22 leaf samples were collected from Dobuilevu. These has been selected earlier from stage 1 2009 series. The remaining 8 samples were collected from stage 1 2010 series in Rarawai. 51 DNA samples (including parents) were extracted and sent to MSIRI for verification. The DNA was extracted using CTAB method, vaccum dried and sent to Mauritius. The results obtained indicated that none of the clones sent for testing were Erianthus hybrids.

**ANALYTICAL LABORATORY
&
METEOROLOGY**

Analytical Laboratory

Introduction

The SRIF analytical laboratory provides analytical support services to growers, individual organizations and research projects. The laboratory has the capability to conduct a broad cross section of analysis and three major analysis carried out in the laboratory are soil, plant and cane analysis. Soil and plant samples are received from the growers and research trials at the four mill districts for fertilizer recommendation. The soil and plant samples are analyzed for various nutrient elements namely; potassium, phosphorous, calcium, magnesium and pH for soils. In addition organic matter, nitrogen, electrical conductivity, cation exchange capacity and pH buffering capacity are also determined in the research projects soil samples. Cane samples are analyzed for %pol, %brix, and %fiber for research trials conducted by SRIF and also for mill auditing purposes. The laboratory conducts soil salinity and sodicity test upon request by Sugar Tribunal and Fiji Sugar Cooperation. The laboratory also provided special analysis for a collaborative project with MSIRI. Soil, bedload and run off samples were collected from newly planted farms for this project and analysed. Attachment opportunities are also provided to graduates to obtain knowledge about research/laboratory activities carried out at SRIF that is a pre requisite for some courses offered by the Universities.

Soil and Leaf samples

A total of 1266 advisory soil samples and 80 advisory leaf samples were received from the four districts for plant and ratoon crop fertilizer recommendations. There was a slight improvement in number of samples received from extension services. 2012 recorded 1168 more soil samples compared to only 98 samples in 2011. The number of samples received from each district is summarized in table 1. 216 soil samples were received from research projects which were analyzed for nitrogen, potassium, phosphorous, pH, and organic carbon.

District	advisory soil	research soil	leaf samples
Lautoka	262	216	
Rarawai	351		
Penang	60		
Labasa	593		80
Total	1266	216	80

Projects	cane samples
Agronomy	200
Disease	249
Field Audit	46
Small mill Project	304
Variety	1475
Total	2274

Cane Analysis

A total of 2274 cane samples were analyzed in 2012 from agronomy, variety and disease trials as well as small mill projects and field audit as summarized in table 2.

Quality Assurance

The analytical laboratory adhered to quality control checks by including quality control samples with each analysis batch. Daily calibration checks of room temperatures, pH and EC of distilled water were recorded. The laboratory also participated in SPACNET proficiency programs for accreditation of SRIF laboratory to international standards.

Small Mill Projects

Two projects were carried out in the small mill laboratory to test the efficiency of the two grinders namely Jeffco and Cane disintegrator and verify methods used to analyze cane. In the first project, 290 cane samples of Mana variety were grinded using Jeffco Cutter Grinder (145 samples) and Wet Cane Disintegrator (145 samples) and analysed. The residual cake was oven dried using both bag and tray method from the grinded samples. The purpose of

this trial was to decide which grinder should be used for grinding cane samples. The averaged %pocs data from each method/equipment is presented in table 3

Table 3: Comparative pocs values

Bag/Disintegrator	11.337
Bag/Jeffco	10.207
Tray/Disintegrator	11.224
Tray/Jeffco	10.245

In this project the %pocs values were found to be a unit higher when cane was grinded with the disintegrator. In the second project seven varieties namely; Naidiri, Kiuva, Kaba, LF91-1925, Mana, Ragnar and Beqa were grinded using Jeffco cutter grinder and Wet cane disintegrator including the trash and analysed. The purpose of this trial was also to decide which of the two grinders should be used for grinding cane samples. The data obtained is shown in table 4.

Table 4: Bio-chemical data of varieties from Jeffco and Disintegrator grinded cane

Variety	%brix		%fibre		%pol		%pocs	
	D	J	D	J	D	J	D	J
Naidiri	19.4	19.2	12.00	13.75	17.72	17.10	13.81	12.84
Kiuva	20.2	19.2	11.38	13.43	18.37	16.74	14.42	12.49
Kaba	19.5	18.7	11.23	13.58	17.85	16.47	14.09	12.32
LF91-1925	18.3	19.0	11.01	13.34	16.80	17.02	13.29	12.89
Mana	17.6	17.7	9.74	12.64	15.46	15.27	12.10	11.39
Ragnar	18.9	18.4	10.49	12.00	17.08	16.14	13.46	12.28
Beqa	21.3	20.4	12.82	14.93	20.66	18.42	16.50	13.74

Note: D- Disintegrator and J-Jeffco cutter grinder

All the seven varieties tested at the small mill produced a lower pocs when grinded by the Jeffco cutter grinder. The results (outcomes) from these projects were to use Jeffco cutter grinder for cane grinding and tray method for fiber analysis.

Field Audit

A field audit was conducted to assess post-harvest cane and sugar losses due to harvesting and poor loading of cane. A total of seven farms that was mechanically harvested were surveyed for this audit in Lovu and Drasa sectors. A total of nineteen farms that was manually harvested were surveyed for this audit in Lovu and Drasa sectors. Out of the nineteen farms, fifteen were on flat and four on undulating land.

Table 5: Cane (tch) losses due to mechanical harvesting practices

Sector	Type	Stalks (tch)		Stumps (tch)		Total tch range
		range	average	range	average	
Lovu	Flat	1.0 – 2.7	2.1	0.2 -1.5	1.0	2.4 – 4.0
Drasa	Flat	0.3 -1.6	0.9	1.0 -2.7	1.7	2.3 – 3.0
Average			1.6		1.3	2.9

Table 6: Cane (tch) losses due to manual harvesting practices

Sector	Type	Stalks (tch)		Stumps (tch)		Total tch range
		range	avg	range	avg	
Lovu	Flat	0.8 -4.3	1.5	0.5 -1.4	1.0	1.3 - 5.5
	Undulating*	1.9	1.9	1.9	1.9	3.8
Drasa	Flat	0.9 – 4.6	2.5	1.4 -7.2	3.6	2.3 -9.8
	Undulating	0.3 – 1.6	0.8	0.3 – 2.9	1.3	0.7 – 4.6
Average			1.9		2.1	4.0

*Only one farm surveyed

Table 7: Sugar (tsh) losses due to mechanical and manual harvesting practices

Sector	Type	Mechanical tsh			Manual tsh		
		range	avg	\$value	range	avg	\$value
Lovu	Flat	0.27 – 0.45	0.36	630	0.14 – 0.62	0.28	490
Lovu	Undulating				0.43	0.43	753
Drasa	Flat	0.25 – 0.34	0.29	507	0.25 – 1.10	0.68	1190
Drasa	Undulating				0.08 – 0.51	0.23	402
Average			0.33	\$577		0.41	\$717

\$value based on local retail sugar price of \$1.75/kg and POCS of 11.2 used in calculating tsh that is the 2012 crushing season average until July end

The total losses in sugarcane harvesting inclusive of leftover cane stalks and non-harvested stumps was 2.9 tch and 4.0 tch with mechanical and manual harvesting respectively as shown in tables 5 & 6. This loss is equivalent to 6 and 8% of the national average production of 50 tons per hectare. Table 7 shows the estimated money that is lost due to different harvesting practices.

Meteorology

Introduction

The Meteorological Station at Sugar Research Institute of Fiji is equipped with a range of meteorological instruments and maintained with the help of the Fiji Meteorological Service (FMS) at its head office in Drasa, Lautoka and three other daily Climatological recording centres. Climatological stations are manned by observers who take climate readings of temperatures (dry, wet, maximum and minimum), rainfall, amount of cloud, visibility and wind direction at 9am and maximum temperature at 3pm daily.

At the end of each month, data is compiled in a standard form F211 and forwarded to FMS. Similarly, rainfall figures from each sector from the eight districts are compiled and kept for our records. The climatic data is used to produce climate summary and predicting of weather forecast for the country. In collaboration with FMS, the Research Institute provides farmers advice on possible farm activities such as land preparation, cultivation, fertilizer application, weedicide application and harvesting from sugarcane belt areas.

Rainfall

The annual rainfall for all the 4 mills was above average when compared to the 42 years average. For Lautoka, Rarawai, Penang and Labasa, the annual rainfall was incremented by further 77 %, 21%, 25% and 15% respectively when compared to the 42 years average. For Lautoka, January to April, June, September and October recorded above average rainfall while the rest of the months recorded close to or below average rainfall. For Rarawai, January, February, June, September and October recorded above average rainfall. July had no rain while heavy rain in March/April resulted in rain gauge being damaged.

For Penang, January, February, April, June, August, September, October and December experienced above average rainfall while the other months received less rain compared to the 42 years average. For Labasa, January to March, June, September, October and December received above average rainfall while the other months had little rain. The rainfall received throughout 2012 favoured rapid weed growth and thus growers were advised to apply fertilizer by the end of the year to all plant and ratoon cane so that it could have been taken up by plants progressively. Heavy rain from late June affected crushing of cane as farmers faced difficulty in harvesting and transporting of cane to their respective mills.

El Niño Southern Oscillation (ENSO)

El Niño–Southern Oscillation is an irregular cycle of persistent warming and cooling of sea surface temperatures in the Tropical Pacific Ocean. The warm extreme is known as El Niño and cold extreme, La Niña. From April to June 2012, conditions in the equatorial tropical Pacific were at neutral levels (neither El Niño nor La Niña). However from July, sea surface temperatures (SSTs) increased to weak El Niño levels. Despite the central Pacific SSTs being warmer than average through August and early September, the atmosphere failed to cool.

The Pacific SSTs returned to neutral values by early October and the ocean-atmosphere remained at neutral. ENSO indicators in the tropical Pacific remained at neutral levels for the month of November and SSTs remained warmer than average but below El-Niño level. The sub-surface temperatures across most of the equatorial Pacific Ocean continued to be above average. Atmospheric indicators of ENSO, such as the Southern Oscillation Index (SOI), trade winds and tropical cloud patterns, all remained at neutral levels. The trade winds and cloudiness near the Date Line have remained near average over most of the tropical Pacific. Fiji's weather in December was influenced by the moist southeast wind flow, series of troughs

of low pressure and severe Tropical Cyclone (TC) Evan. The cyclone brought torrential rain and caused flooding in Penang Mill and Rarawai Mill.

Relative Humidity

Relative humidity calculated at 0900hrs was generally average to above average in Lautoka Mill for all the months.

Sunshine

There is no sunshine recorder at the new site in Drasa after theft of the old instrument.

Earth Thermometers

The earth temperature at a depth of 5cm was slightly higher than the long-time average for the months of January, March, July, August, November and December whereas at a depth of 10cm was above average for all the months except February. For the 20cm temperatures, January and March till December all have above average values.

Soil Moisture

Soil moisture could not be determined due to damage and theft of raised and sunken pan.

Air Temperatures

The daytime air temperatures are very close to and above average or normal to above normal for Lautoka Mill during January to December 2012. The highest maximum temperature recorded was 33.8°C for the month of January and the lowest minimum temperature was recorded as 15.5°C for the month of May.



Meteorological Station – Drasa Lautoka

Table 8: Rainfall (mm) for all mills 2012

Mills	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lautoka Mill													
Monthly Rainfall	854	579	894	406	78	210	14	53	296	120	35	236	4806
No. of rain days	18	20	17	15	8	7	4	5	12	9	10	10	135
42 yrs. Avg (1971-2012)	383	313	322	195	89	73	55	73	81	102	138	186	2012
% of Average	223	185	278	208	88	286	25	73	365	117	25	13	177
Rarawai Mill													
Monthly Rainfall	825	710	275	*4	80	173	0	46	238	173	100	164	2788
No. of rain days	15	22	17	4	8	9	0	9	13	9	13	11	130
42 yrs. Avg (1971-2012)	394	356	370	199	94	83	44	67	80	110	157	231	2184
% of Average	210	200	74	2	85	208	0	69	298	158	64	0	121
Penang Mill													
Monthly Rainfall	990	477	235	576	41	165	19	75	215	147	60	430	3000
No. of rain days	24	22	18	17	11	8	7	10	12	15	8	15	167
42 yrs Avg (1971-2012)	437	344	373	261	154	99	53	72	92	111	158	255	2409
% of Average	226	139	68	221	27	167	35	104	234	133	38	168	125
Labasa Mill													
Monthly Rainfall	567	754	411	229	37	99	12	38	175	189	167	276	2679
No. of rain days	24	24	19	20	9	8	5	8	12	15	14	15	173
42 yrs Avg (1971-2012)	413	363	361	245	111	79	54	50	78	119	188	261	2320
% of Average	137	208	114	94	33	127	23	76	223	159	89	106	115

Table 9: Rainfall Data (mm) for Lautoka Mill 2012

Sectors	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Drasa	1025	674	781	236	114	220	6	57	298	114	71	9	3605
No. of rain days	19	23	18	15	5	7	1	4	9	6	8	1	116
Saweni	547	255	131	87	54	207	63	41	213	95	25	118	1836
No. of rain days	10	10	8	8	4	6	3	2	8	6	7	7	79
Natova	875	428	248	224	142	285	72	41	210	96	119	333	3073
No. of rain days	15	12	12	20	5	6	4	2	12	6	9	9	112
Legalega	858	517	430	222	9	252	13	65	178	65	121	140	2869
No. of rain days	18	16	9	9	1	6	1	4	9	4	9	10	96
Meigunyah	885	545	483	223	25	320	17	49	190	68	127	119	5937
No. of rain days	13	11	9	10	5	5	2	4	10	4	8	9	90
Malolo	1270	856	908	315	130	340	40	106	289	62	158	103	4575
No. of rain days	10	19	19	15	6	6	1	5	10	6	8	10	115
Nawaicoba	922	686	939	317	65	216	54	111	258	49	114	210	3939
No. of rain days	18	19	21	14	6	6	1	4	11	6	10	18	134
Yako	761	532	779	215	23	337	35	93	246	57	98	42	3219
No. of rain days	17	19	20	14	4	6	1	4	11	6	8	8	118
Lomawai	399	385	331	273	38	174	53	47	220	65	131	222	2336
No. of rain days	8	11	11	11	5	5	4	2	5	5	10	9	86
Cuvu	612	479	404	166	51	91	94	97	213	98	88	251	2644
No. of rain days	10	11	12	11	9	9	14	7	9	7	10	11	120
Olosara	90	481	396	348	45	190	143	80	181	100	105	249	2408
No. of rain days	3	12	11	14	6	9	9	5	8	6	10	10	103

Table 10: Rainfall Data (mm) for Rarawai Mill 2012

Sectors	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Varoko	1418	1278	773	465	39	171	0	37	253	85	51	236	4806
No. of rain days	13	21	16	11	2	5	0	2	8	6	8	4	96
Mota	1209	729	533	298	36	185	0	94	230	92	96	143	3645
No. of rain days	14	13	13	12	3	5	0	5	10	5	6	8	94
Koronubu	1516	704	1038	525	60	186	0	57	207	116	98	226	4733
No. of rain days	16	22	16	12	2	6	0	4	9	7	7	8	109
Rarawai	825	710	275	*4	80	173	0	46	238	173	100	164	2788
No. of rain days	15	22	15	2	6	8	0	7	12	8	13	11	119
Veisaru	1123	427	584	266	23	169	3	18	198	118	96	97	3122
No. of rain days	11	12	9	7	2	5	1	3	7	8	6	5	76
Varavu	1048	271	600	345	5	133	0	18	222	57	67	64	2831
No. of rain days	9	11	10	9	1	5	0	2	10	7	4	4	72
Naloto	1282	947	562	401	50	186	0	106	218	167	179	157	4255
No. of rain days	15	16	15	12	4	5	0	5	9	6	5	8	100
Tagitagi	1364	593	818	262	39	175	0	38	246	57	41	179	3812
No. of rain days	11	13	9	11	2	4	0	4	7	3	4	2	70
Drumasi	1404	634	1015	476	25	147	0	39	146	109	82	196	4273
No. of rain days	11	14	11	18	1	4	0	4	7	3	4	2	79
Yaladro	1250	503	608	347	42	159	0	34	157	30	33	190	3353
No. of rain days	11	13	10	14	2	4	0	4	7	3	3	2	73

*Rain gauge replacement – mid April.

Table 11: Rainfall Data (mm) for Penang Mill 2012

Sectors	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Ellington 1	92	271	202	379	17	87	17	14	69	78	35	230	1491
No. of rain days	1	16	15	15	4	9	11	2	7	6	5	7	98
Malau	990	477	235	576	41	165	19	75	215	147	60	430	3430
No. of rain days	24	22	18	17	11	8	7	10	12	15	8	15	167
Nanuku	665	665	594	306	15	198	15	54	153	26	45	213	2949
No. of rain days	12	18	13	11	3	4	2	2	6	4	4	3	82
Ellington 11	652	537	535	263	57	82	43	40	160	235	63	560	3226
No. of rain days	19	21	18	19	12	7	9	5	10	15	3	12	150

Table 12: Rainfall Data (mm) for Labasa Mill 2012

Sectors	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Waiqele	822	706	447	178	38	38	18	0	241	210	179	289	3164
No. of rain days	20	19	17	18	6	6	4	0	12	14	15	14	145
Wailevu	494	731	377	208	56	15	1	0	238	109	181	310	2719
No. of rain days	15	21	19	14	6	4	1	0	7	15	14	16	132
Vunimoli	798	697	445	223	45	72	9	0	244	206	137	321	3197
No. of rain days	23	24	17	18	7	7	4	0	11	14	12	16	153
Korowiri (Labasa)	567	754	411	229	37	99	12	38	175	189	167	276	2955
No. of rain days	24	24	19	20	9	8	5	8	12	15	14	15	173
Nagigi (Bucaisau)	727	830	453	288	61	29	5	0	250	260	204	279	3388
No. of rain days	16	19	18	18	5	4	2	0	7	13	14	12	128
Wainikoro	745	572	433	203	72	52	9	0	141	229	153	390	2998
No. of rain days	19	19	17	19	7	5	1	0	10	13	13	16	139
Daku	989	594	446	309	179	33	6	0	160	232	195	247	3390
No. of rain days	24	20	21	18	8	5	2	0	14	14	12	18	156
Natua (Seaqaga)	458	507	511	186	33	28	22	0	146	138	112	364	2506
No. of rain days	27	24	21	21	9	7	6	0	12	11	13	19	170

Table continued on next page ->

Table 12 cont'd

Sectors	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rokosalase (Solove)	551	627	629	395	54	97	10	0	280	227	205	546	3621
No. of rain days	28	26	20	18	2	6	2	0	11	8	7	11	139
Naravuka (Bulivou)	720	720	436	399	43	48	17	0	168	205	151	430	3337
No. of rain days	17	23	17	21	8	2	2	0	9	9	8	14	130
Kuru kuru (Daku)	785	848	478	460	74	65	7	0	151	264	166	357	3655
No. of rain days	20	23	15	24	6	5	1	0	7	14	8	12	135
Vunivutu	723	729	566	379	41	49	1	0	127	228	153	301	3297
No. of rain days	26	24	21	20	8	5	1	0	12	12	14	17	160
Papalagi	563	655	368	449	22	74	7	0	166	226	155	290	2975
No. of rain days	26	19	15	17	3	8	1	0	12	12	11	10	134
Seaqqa Sub. St.	748	863	621	247	48	39	30	0	256	305	163	294	3615
No. of rain days	16	23	21	19	4	6	1	0	13	14	12	15	144

Table 13: Meteorological data for Sugar Research Institute of Fiji, Lautoka 2012

Measurements	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Relative Humidity	78	80	75	82	76	75	70	69	69	72	72	73	74.3
43 yrs Avg (1970-2012)	75	77	77	75	74	72	69	68	69	66	70	72	72.0
<i>Air Temperature (°C)</i>													
Mean Maximum	31	31	32	30	29	29	29	30	30	31	31	32	30.4
Mean Max 43 yrs avg (1970-2012)	32	32	31	31	30	28	28	28	29	31	31	31	30.2
Mean Minimum	23	23	23	22	21	20	21	20	21	22	22	23	21.8
Mean Min 43 yrs avg (1970-2012)	24	24	24	24	22	20	20	20	21	26	23	23	22.6
Mean	27	27	27	26	25	24	25	25	26	26	26	27	25.9
Highest Maximum	34	33	34	32	33	31	32	32	32	33	34	33	32.8
Lowest Minimum	22	21	21	21	16	16	16	16	19	19	18	21	18.8
<i>Earth Temperature (°C)</i>													
5cm	30	28	29	26	25		25	25	27		30	31	27.6
10cm	29	28	29	27	26		25	26	27		29	29	27.5
20cm	30	29	29	28	27		26	27	27		30	30	28.3
100cm	23	22	23	22	22			21	21		23	-	22.1
43 yrs Avg (1970-2012): 5cm	29	29	29	27	26		24	25	27		30	30	27.6
43 yrs Avg (1970-2012): 10cm	29	28	28	27	26		24	25	26		29	29	27.1
43 yrs Avg (1970-2012): 20cm	29	29	29	28	27		26	26	27		29	30	28.0

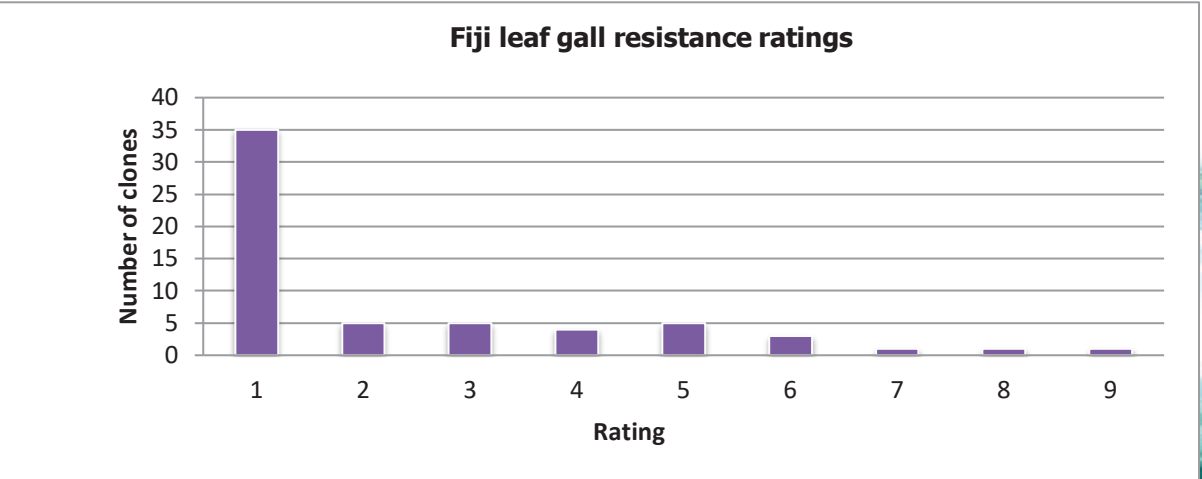
Note: Earth temperature readings was provided by Fiji Meteorological Station thus June and October earth temperatures was not in their records.

CROP PROTECTION

Fiji Leaf Gall Disease (FLGD)

Fiji disease is caused by a virus and the disease is spread by leaf hoppers from infected plant to non-infected plant. Duruka (*Saccharum edule*) is the alternate host of this disease and Mana is the most popular commercial variety, which is affected by this disease. Screening new varieties for Fiji disease resistance continued this year. A total of 60 varieties from the LF2009 series were tested for resistance to Fiji disease. The screening was conducted during the February to November period. The screened ratings obtained for the standards were similar to the established ratings. The screened ratings were supported by statistical analysis that showed that the ratings and days are highly significant ($P<0.000$). There were negative linear relationships between standards and days ($R^2=0.9149$). Some of the varieties released for commercial cultivation over the years show differences in the field reaction to the Fiji disease. Example: the variety Mana is highly resistance to Fiji disease and had a rating of 1. Under field conditions this variety shows intermediate resistance for Fiji disease. The commercial varieties that have been given resistant ratings should be screened again. They may be tolerant to the disease but act as a carrier of the virus.

Table 1: Number of clones screened for Fiji leaf gall disease			
Series screened	Clone Resistance (Ratings)		
LF 2009	Resistance (1-3)	Moderate (4-6)	Susceptible (7-9)
	45	12	3



Breeding of plant hoppers (*Perkinsiella vitiensis*) on Fiji 10 (*Erianthus maximus*)

Job's tear as host of FDV

A preliminary experiment was conducted on Mana, Kaba and Job's tear (*Coix lachryma jobi*) plants in 3 replications to study whether leaf hoppers can complete their life cycle. After conducting this experiment it was found that the hoppers (*Perkinsiella vitiensis*) were not able to complete their life cycle on Job's tear plant successfully, possibly due to its strong unpleasant smell, compared to Mana and Kaba plants.

The second instar nymphs from the infected Fiji 10 were collected and placed on healthy uninfected Job's tear, Mana and Kaba plants. This was done to flush out the virus from their system to their salivary gland and infect the healthy plants. Inspections carried out over 100 days showed that the Job's tear leaf were forming wrinkles and pseudo galls from under the leaf surface but no Fiji Leaf Gall was observed on the studied plants.

Disease Control

Fiji disease has showed a low incidence for 2012 season. The disease control inspectors had covered 7,491.12 ha of total crops for 2012 season. The inspectors found and destroyed 534 stools of Fiji disease which was lower, compared to last year. The Fiji disease stools were found mainly on Mana ratoon and mostly in Nawaicoba sector of Nadi. 224 stools were found in this sector alone. Labasa and Rarawai mill area did not record any incidence of Fiji disease. Labasa had the highest number of farms inspected, an area of 3,775.91 ha checked by the two rouging teams.

FSC seed cane nursery was inspected in the different mills and 91 stools of FLD were found on farm 1204 in Ellington II of Penang mill region. The area of this field was 1.6 ha planted with Mana variety. A total of 49.5 ha of seed cane nurseries were inspected.

Table 2: Summary of rouging inspections in 2012

Mill District	No. of farms Inspected	Area Rouged (Ha)		No. of FLGD stools Rouged
		Plant	Ratoon	
Lautoka	422	75.57	725.35	67
Nadi	705	126.49	1547.75	224
Labasa	859	528.01	3247.90	0
Sigatoka	400	66.70	659.50	152
Rarawai/Tavua	267	82.42	306.29	0
Penang	111	32.79	92.35	91
Total	2,764	911.98	6579.14	534

Cane Weevil Borer

Cane weevil borer is a destructive sugarcane pest, which causes damage to the sugarcane stalks. This insect belongs to the phylum – Arthropoda which is classified as Insecta and was introduced in Fiji through Australia and Hawaii from PNG during seed exchange. A two year project is being carried out on Integrated Pest Management of the Sugarcane Weevil Borer (*Rhabdoscelus obscurus*) in Fiji with guidance from BSES in Australia.

Split cane traps and Pheromone traps were used to monitor trends in sugarcane weevil borer's population on commercial fields of Viti Levu mill areas from October, 2010 to August, 2012. The population of female borer collected was higher than the male borer by using both the pheromone and split cane trap.

By placing the split cane traps continuously for 14 months in 18 farms, there was increase in average yield per farm by 5.18 tons/ha whereas in pheromone traps that were placed in 4 farms, average yield increased was 12.27 tons/ha. The increase in cane yield could also be

due to other factors such as rainfall and management practices. An average of 3550 and 3879 borers per farm were collected from October 2010 to September 2012, by placing split cane and pheromone traps respectively.

By placing the CWB pheromone traps in a particular farm over a period of time, it will be possible to monitor whether there is decrease or increase in the borer population. In addition it will be possible to monitor whether the number of male and female is decreasing or increasing in population. Pheromone mass trapping of adult borers is an effective method of monitoring and may also impact on their population densities. The most effective trap for capturing adult borers was pheromone trap. Further trials will be conducted to confirm this.



Split cane traps are placed near the sugarcane roots to trap adult borer.



Pheromone traps placed on headland of sugarcane farm to trap adult female borer.

Nematology

The two nematodes management trials were laid in Drasa on field 17 & 11, in ratoon and plant crop respectively. The treatments applied in ratoon cane are cowpeas and distillery effluent at different rates where as in plant cane only distillery effluent was used at different rate.

The results showed that the population of plant parasitic nematodes fluctuated from time to time in both the trials. In both the trials, species of Spiral and Reniform nematodes were observed in all the plots. Cane yield for the 20 plots in plant trial was 72.2 ton/ha and for 16 plots of the ratoon trial was 64.7 ton/ha. None of the treatments had significant impact on plant parasitic nematodes. It was also observed that the population of free living nematodes (FLN) was higher than the plant parasitic nematodes (PPN).

Borer causes damage to the sweetest part of sugarcane

CROP PRODUCTION

Seed Cane Nursery Program

Heat treatment of seed cane before planting is used to eliminate bacterial disease such as RSD prior to the establishment of seed cane nurseries. Hot-water treatment (50° C for 2-3 hours) is the method most commonly used to control ratoon stunting disease (RSD). Heat treatment for seed cane production continued in the 2012 season. The uptake of seed cane from the estates in 2012 has improved gradually as the Extension division has become active and farmers realizing the benefits of planting seed cane from approved plots.

Table 1: Uptake trend of seed cane from Approved seed plots

Year	seed cane available (tons)	seed cane taken (tons)	% uptake to date
2010	4368	176.45	4.0
2011	3776.2	237.46	6.3
2012	2268	177.31	7.8

The amount of seed cane that was available for planting in 2012 was 2858 tons that if all was taken via Extension, would have covered an estimated area of 476 hectares. The floods of 2012 hampered the plan of seed cane planting during the year and by the late planting season only 250 tons of good seed cane was available. Tropical cyclone Evan occurred on the 16-17th December 2012 and caused minimum damage to the young ratoons and new plant.

An inspection for pest and disease of the seed beds was done and found only minor leaf diseases present. Sampling for ratoon stunting disease (*Leifsonia xyli* subsp. *xyli*) was conducted with all the varieties in the mother plot showing negative readings. This shows the positive effects of heat treatment as a curative of RSD.

HWT seed cane sold from the estates totaled 177.31 tons which was taken by farmers through the FSC Extension division. Of the total of 2286 tons available, 7.8% was taken up.

Heat treated Naidiri seed cane variety at Drasa Station



Seed cane in farmers' seed plot

Agronomy

Effect of potassium fertilizer on cane yield in plant cane

A trial established at Drasa estate was evaluated for responses to the different potassium treatments in terms of %pocs, cane and sucrose yields. The initial soil analysis results for the trials were pH 4.8, P 12 mg/kg, and K 83 mg/kg. The trial had no significant responses in the plant crop in terms of %pocs, cane and sucrose yield. The trial will be further evaluated for ratoon response to %pocs, cane and sucrose yields.

The effects of time of harvest on sugarcane yield in Fiji.

A trial established at Drasa estate with three commercial varieties; Kiuva, Naidiri and Mana, was evaluated for responses to harvesting time in terms of %pocs, cane and sucrose yields. The data obtained from plant crop indicated that there was no significant difference between the variety and season in terms of %pocs, cane and sucrose yields in the next crop.

GIS

The plot level mapping was completed for Lovu sector and verification and rectification of data with field exercise were completed in late May. The merge between plot level and cadastral boundary was in line with a few overlaps. Some of the inaccuracies of conflicts between polygons were assumed to be of projection error as different projection may have been used to create the cadastral boundaries. Plot level mapping allowed information to be obtained in a more defined manner as it shows the plot level information of a grower. The digital map of plots is in the SRIF GIS system and the result of survey is summarized as below and is shown at plot level:

Drasa Sector:

- **702** GROWERS
- **2674** PLOTS
 - **2350** - MANA
 - **15** - KIUVA
 - **12** - KABA
 - **12** - LF91-1925
 - **23** - NAIDIRI
 - **19** - RAGNAR
- **192** - LONG FALLOW
- **36** - SHORT FALLOW
- **161** - NEW PLANT
- **118** - RATOON > 20 YEARS

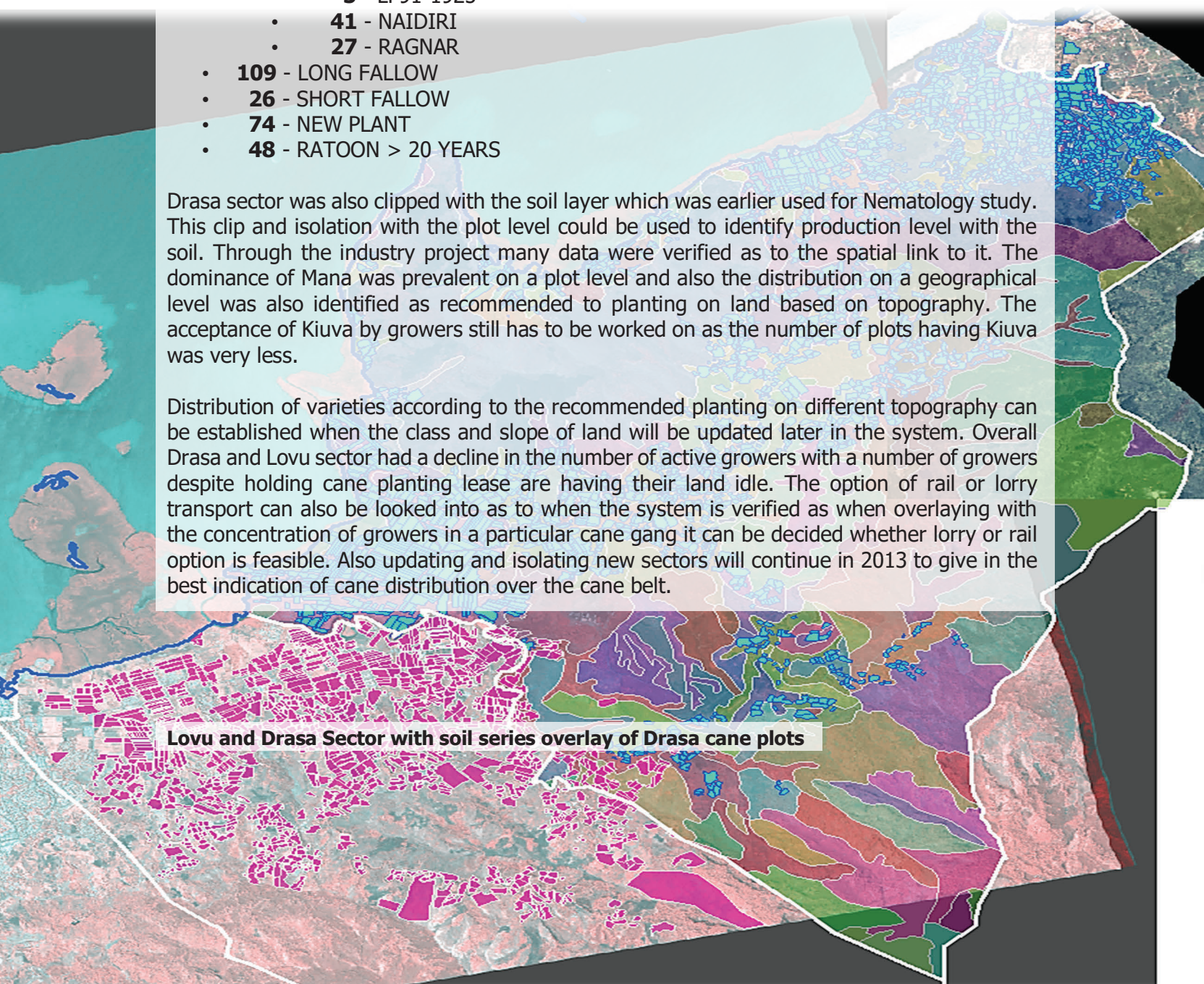
Lovu Sector:

- **392** GROWERS
- **1431** PLOTS
 - **1105** - MANA
 - **8** - KIUVA
 - **33** - KABA
 - **5** - LF91-1925
 - **41** - NAIDIRI
 - **27** - RAGNAR
- **109** - LONG FALLOW
- **26** - SHORT FALLOW
- **74** - NEW PLANT
- **48** - RATOON > 20 YEARS

Drasa sector was also clipped with the soil layer which was earlier used for Nematology study. This clip and isolation with the plot level could be used to identify production level with the soil. Through the industry project many data were verified as to the spatial link to it. The dominance of Mana was prevalent on a plot level and also the distribution on a geographical level was also identified as recommended to planting on land based on topography. The acceptance of Kiuva by growers still has to be worked on as the number of plots having Kiuva was very less.

Distribution of varieties according to the recommended planting on different topography can be established when the class and slope of land will be updated later in the system. Overall Drasa and Lovu sector had a decline in the number of active growers with a number of growers despite holding cane planting lease are having their land idle. The option of rail or lorry transport can also be looked into as to when the system is verified as when overlaying with the concentration of growers in a particular cane gang it can be decided whether lorry or rail option is feasible. Also updating and isolating new sectors will continue in 2013 to give in the best indication of cane distribution over the cane belt.

Lovu and Drasa Sector with soil series overlay of Drasa cane plots



Drasa Estate

Drasa Estate has a total area of 122.1 hectares available for cane planting. In 2012, 57.2 ha were under commercial cane, 2.2 ha were under research trials, 23.9 ha was under old other variety and 38.8 ha was short fallow. The total cane production at Drasa Estate in 2012 season was 4155 tons from an area of 83.3 hectares that gave a yield of 50 tons per hectare. There was a decrease in cane production from 82tch in 2011 to 50tch in 2012. In addition there was an increase of 6% in burnt cane (1248 tons or 30% of 4155t in 2012) as compared to previous year (1918 tons or 22% of 8770t in 2011). The table below summarizes the cane production in 2012.

Crop	Commercial			Research			Old Other Variety			Total		
	ha	tons	tch	ha	tons	tch	ha	tons	tch	ha	tons	tch
Plant	2.2	171	78	1.4	133	95	2.7	148	55	6.3	452	72
1R	12.2	426	35	0.3	31	103	7.3	482	66	19.8	939	47
2R	23.2	1183	51	0.3	15	50	5.9	315	53	29.4	1513	51
OR	19.6	931	48	0.2	11	55	8.0	309	39	27.8	1251	45
Total	57.2	2711	47	2.2	190	86	23.9	1254	52	83.3	4155	49.9

During the year a total of 4083mm of rainfall was received and this was 907mm more compared to 2011 season (3176mm). The first half of the year received above average rainfall and this caused drawback to the planting season. Wide spread flooding was experienced in January (24-25th) and March (29-30th) due to heavy rains. This resulted in heavy deposit of silt and debris in and around the estate fields. The floods caused extensive damages to the cane crop, fields, roads, and drains. The flooding was the worst ever experienced according to residents nearby. The fields were completely under water and it took more than a week for the water to recede. Due to water logged conditions after the flood, the growth of cane in most affected fields were stunted with thin stalks. The cane production per hectare decreased by 32 tons compared to 2011 season. It was most likely that some of the chemical fertilizer would have leached during the flooding.

All fertilization was done mechanically except the trials. A total of 1048 bags of fertilizer was applied that included 48 bags blend B and 1000 bags blend C. In nutritional value the 2012 crop received 218kgN/ha, 17kgP/ha and 161kgK/ha. The 2012 harvesting season commenced on 22/06/12 and ceased on 04/12/12 whereas estate harvesting commenced on 28/06/12 and ceased on 01/12/12. Apart from research cane (190t) and commercial cane (2932t) which was harvested manually the remaining cane (1033t) was harvested mechanically. All cultivation, fertilization and harvesting was given out on contract. Total cane planted in 2012 was 10 hectares out of this 5.5ha was Naidiri, 0.5ha other variety, 4.0 ha seed cane nursery distribution plots were planted that consisted of 1.4ha Ragnar, 1.3 ha Aiwa and 1.3 ha Beqa. Approximately 135 tons of cane from the estate was used as seed material, out of this 70 tons was used for estate planting, 33t was sold to FSC for establishment of seed cane nurseries and 32t was sold to farmers.

Year	Area ha	Tons					Yield tch
		Burnt	%	Green	%	Total	
2008	114.8	2864	40	4254	60	7118	62.0
2009	94.2	3262	46	3082	54	6344	67.0
2010	108.0	1498	25	4499	75	5997	56.0
2011	107.6	1918	22	6782	78	8700	82.0
2012	83.3	1248	30	2907	70	4155	50.0

Nadi Estate

Nadi Estate has a total area of 64.9 hectares available for cane planting. In 2012, 46.6 ha were under commercial cane and 18.3 ha was short fallow. The total cane production at Nadi Estate in 2012 season was 2233 tons from an area of 46.6 hectares that gave a yield of 48 tons per hectare. There was a decrease in cane production from 79tch in 2011 to 48tch in 2012. There was a decrease of 37% in burnt cane (508 tons or 23% of 2233t in 2012) as compared to previous year (1938 tons or 60% of 3208t in 2011). The table below summarizes the cane production in 2012.

Table 4: Nadi Estate Cane Production 2012			
Crop	Commercial		
	ha	tons	tch
Plant	13.9	915	66
1R	-	-	-
2R	9.5	325	27
OR	23.2	993	43
Total	46.6	2233	48

During the year a total of 3051mm of rainfall was received and this was 528mm more compared to 2011 season (2523mm). Wide spread flooding was experienced in January (24-25th) and March (29-30th) due to heavy rains. This resulted in heavy deposit of silt and debris in and around the estate fields. The floods caused extensive damages to the cane crop, fields, roads, and drains. According to nearby residents, the flooding was the worst ever experienced and the fields were completely under water. The cane production per hectare decreased by 31 tons compared to 2011 season and part of the decline in production is due to leaching of fertilizers due to the floods and above average rainfall in early part of the season. All fertilization was done mechanically but the actual amount or number of bags applied was not available as there were no records kept. The 2012 harvesting commenced on 20/08/12 and ceased on 09/10/12. Apart from 75 tons which was harvested manually, the remaining cane (2158t) was harvested mechanically. All cultivation, fertilization and harvesting was given out on contract. Total cane planted in 2012 was 4.9 hectares out of this 3.9ha was LF91-1925 and 1ha was Beqa. Approximately 25 tons of cane was used as seed material for estate planting.

Table 5: Nadi Estate production figures for the last five years (2008-2012)							
Year	Area (ha)	Tons					Yield (tch)
		Burnt	%	Green	%	Total	
2008	59.6	948	23	3202	77	4150	69.6
2009	50.7	2344	55	1899	45	4243	83.6
2010	60.3	2074	61	1349	39	3423	56.7
2011	40.6	1938	60	1270	40	3208	79.0
2012	46.6	508	23	1725	77	2233	47.9



Cane damaged by flood waters (water-logged field)

Rararwai Estate

Rarawai Estate produced 3551 tonnes of cane in 2012 season from an area of 60.8 hectares with an average yield of 59 tonnes per hectare. Approximately 200t of seed cane was used for planting at Estate and also sold to growers at mill sectors. The cane production per hectare decreased by 6 tonnes compared to 2011 season. The major reasons for low yield was most of the crops in low lying fields were badly damage by floods.

A total of 2761mm of rainfall was received compared to 3094 mm in 2011.The high rainfall in early months of 2012 caused extensive flooding that brought heavy deposits of silt and debris that damaged the crop in most of the fields. Due to blocked drains there was water logging in the fields that affected the cane growth. Also there was leaching in some of the fields which were fertilized late and this could also be a cause of low yields. Fertilization was done both mechanically and manually. A total of 1399 bags of fertilizer was applied that included 30 bags blend A, 225 bags blend B and 1100 bags blend C.

The 2012 harvesting season commenced on 9th July and ended on 15th December. The contractor harvested 1952t (58%) and the remaining crop including the trial cane was harvested by Estate casuals and outside assistance gangs. Out of 3351t cane harvested and sent to mill, 2932t was green and 1319t. Total of 18.8 hectares was planted which comprise of 8.0ha research and 10.8ha seed cane nursery. Drainage needs to be upgraded in almost all the estate fields to solve problem of waterlogging which to some extent is one of the main reason for declining yield.

Table 6: Rarawai Estate production figures from 2008 -2012		
Year	Production	Yield tch
2008	4400	59
2009	4750	62
2010	4265	60
2011	3900	65
2012	3551	59



Inundated field during the January 2012 flooding

FACP APPENDICES

Appendix 1: Main features of 2012 season compared with 2011

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Total registrations (Numbers)	5379	5242	5154	5097	3969	3958	1876	1713	16378	16010
Total farm basic allotments (tonnes)	915058	905267	889784	891486	873953	874558	301174	248938	2979969	2920249
Total registered area (hectares)	22816	22272	21825	21569	17931	18385	8897	7824	71469	70049
Total area cultivated (hectares)	14149	14570	18860	19829	16893	15438	5709	4054	55610	53891
Total area harvested (hectares)	11954	12204	12661	12871	14454	13358	3787	3525	42856	41959
Total farm harvest quotas (tonnes)			889784				141855			
Sugar make actual (tonnes)	47287	46576	59022	44571	44015	44394	16345	19145	166669	154686
Tonnes 94 N.T sugar	50306	48129	61028	45732	45146	45398	16838	19908	173318	159166
Yield tonnes 94 N.T.sugar per hectare	4.21	3.80	4.82	3.80	3.05	3.40	4.45	5.60	4.04	4.20
Tonnes cane per tonnes sugar 94 N.T.	12.97	10.30	11.03	10.20	13.00	9.30	12.37	8.90	12.14	10.00
%POCS	9.57	10.66	9.84	10.65	10.00	11.64	9.63	11.53	9.77	11.12
Cane purity average for season	80.9	83.6	80.1	79.6	79.9	82.9	79.2	83.5	80.0	82.4
Tonnes Cane harvested	652333	481483	663774	508638	570468	413285	208860	143568	2095435	1546974
Tonnes Cane crushed	644408	481483	673442	508638	570471	413285	208307	143568	2104555	1546372

Appendix 2: Monthly rainfall(mm) for 2012 compared with long term average

Mills	No. of years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lautoka	2012 actual	854	579	894	406	78	210	14	53	296	120	35	236	4806
	104 yrs avg. to 2012	311	321	322	185	98	66	51	69	74	91	126	188	1844
Rarawai	2012 actual	825	710	275	*4	80	173	0	46	238	173	100	164	2788
	127 yrs avg. to 2012	359	360	362	289	79	38	29	97	105	146	223	237	2323
Labasa	2012 actual	567	754	411	229	37	99	12	38	175	189	167	276	2679
	124 yrs avg. to 2012	367	362	378	236	110	65	47	50	104	101	206	254	2276
Penang	2012 actual	990	477	235	576	41	165	19	75	215	147	60	430	3000
	115 yrs avg. to 2012	441	353	406	383	123	70	52	91	87	145	155	243	2545

*Raingauge replacement – mid April.

Appendix 3: Crop production details

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Areas harvested (hectares)										
Plant	1344	279	1370	665	2065	559	521	158	5300	1661
First ratoon	607	1220	1000	1339	1133	1896	235	533	2977	4989
2nd ratoon	708	550	913	914	1040	1114	225	214	2886	2791
Other ratoons	9295	10155	9378	9953	10215	9789	2805	2620	31693	32518
Total	11954	12204	12661	12871	14453	13358	3786	3525	42854	41959
Cane Harvested (tonnes)										
Plant	91463	15059	85721	35333	96417	24529	27772	7315	301373	82236
First ratoon	39719	55265	57951	64017	53792	79898	11935	24959	163397	224139
2nd ratoon	40249	23344	50370	39990	43281	40674	11220	8414	145120	112422
Other ratoons	480902	387815	469732	369298	376978	268184	157933	102880	1485545	1128177
Total	652333	481483	663774	508638	570468	413285	208860	143568	2095435	1546974
Yield tonnes cane per hectare (tch)										
Plant	68.1	53.9	62.6	53.1	46.7	43.9	53.3	46.4	56.9	49.5
First ratoon	65.4	45.3	57.9	47.8	47.5	42.1	50.8	46.8	54.9	44.9
2nd ratoon	56.9	42.4	55.2	43.8	41.6	36.5	49.9	39.4	50.3	40.3
Other ratoons	51.7	38.2	50.1	37.1	36.9	27.4	56.3	39.3	46.9	34.7
Avg. yield/ha	54.6	39.5	52.4	39.5	39.5	30.9	55.2	40.7	48.9	36.9
Varieties crushed (% of total cane harvested)										
Ragnar	0.4	0.37	0.2	0.36	16.2	23.87	0.2	0.06	4.6	6.6
Aiwa	0.4	0.36	0.2	0.15	0.4	0.22	nil	0.01	0.3	0.2
Bega	nil	0.02	nil	Nil	0.1	0.05	nil	nil	nil	nil
Galoa	0.1	0.04	nil	Nil	9.2	4.31	nil	nil	2.5	1.2
Kaba	2.8	2.18	4.0	4.40	0.3	0.21	0.2	0.23	2.2	2.2
Mali	nil	Nil	nil	Nil	13.7	11.13	0.2	0.27	3.8	3.0
Mana	93.9	94.5	93.9	93.1	nil	nil	98.7	98.3	68.8	69.2
Naidiri	1.0	1.07	1.2	1.26	35.5	33.69	0.6	0.86	10.4	9.8
Vatu	nil	Nil	nil	Nil	16.2	16.77	nil	0.05	4.4	4.5
Waya	nil	Nil	0.1	0.27	7.4	8.04	nil	0.10	2.1	2.2
LF91-1925	0.5	0.54	0.1	0.03	0.3	0.48	nil	nil	0.3	0.3
Kiuvu	0.4	0.52	0.1	0.16	nil	0.11	nil	nil	0.1	0.2
Expt./Others	0.5	0.40	0.2	0.22	0.9	1.13	0.1	0.14	0.5	0.5
Total	100	100	100	100	100	100	100	100	100	100

Appendix 4: Rainfall (mm) at mill centres

Mill	For 12 months ended 31st December					For 12 months ended 30th September				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Lautoka	2502	2875	1299	3115	3563	2714	2983	899	2422	3384
Rarawai	3020	2591	1655	2779	2640	3115	2932	1101	3029	2351
Labasa	2448	2479	2275	2814	2679	2815	2709	1568	3087	2322
Penang	3384	3064	1643	3246	3000	3673	3165	1342	3335	2793

Appendix 5: Rainfall distribution affecting 2012 crop(mm)					
Month	Period	Lautoka	Rarawai	Labasa	Penang
July 2011	Early	-	44.7	48.4	6.0
	Mid	-	0.0	3.8	0.0
	Late	-	0.0	48.0	32.8
August 2011	Early	-	64.9	42.8	60.3
	Mid	-	49.4	8.3	9.8
	Late	-	0.0	2.8	28.4
September 2011	Early	1.6	5.4	24.5	30.3
	Mid	0.0	3.8	7.2	1.8
	Late	72.2	41.5	28.0	11.9
October 2011	Early	69.3	147.3	78.5	0.0
	Mid	9.6	102.3	82.0	0.0
	Late	25.2	18.4	0.0	0.0
November 2011	Early	284.6	49.7	16.3	1.2
	Mid	217.8	201.8	177.9	173.6
	Late	220.4	53.9	119.9	214.3
December 2011	Early	73.4	10.4	99.5	24.1
	Mid	44.5	66.7	69.3	119.5
	Late	44.4	101.8	74.9	37.6
January 2012	Early	-	-	195.0	203.2
	Mid	-	-	78.0	35.2
	Late	-	-	293.3	752
February 2012	Early	-	420.2	401.0	274
	Mid	-	209.9	259.0	151.3
	Late	-	80.3	94.0	51.6
March 2012	Early	-	127.1	66.0	122.4
	Mid	-	53.0	44.5	46.1
	Late	-	95.0	301.0	66.8
April 2012	Early	-	0.0	112.0	548.5
	Mid	14.7	0.0	103.0	11.8
	Late	6.0	4.0	15.0	15.2
May 2012	Early	37.7	20.2	10.0	31.7
	Mid	65.6	40.2	28.0	8.8
	Late	0.0	19.1	1.0	0.8
June 2012	Early	76.7	7.3	50.0	43.3
	Mid	141.0	164.9	48.0	114.0
	Late	0.0	0.5	2.0	7.6
Early - 1 st to 10 th of the month Mid - 11 th to 20 th of the month Late - 21 st to end of the month					

Appendix 6: Hectares harvested

Mills	Crop	Average for period of five seasons					Last four seasons individually			
		1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	P	4007	3634	2944	1042	788	888	684	1344	279
	R	19743	20580	19701	19730	14614	13573	13096	10610	11925
	Total	23750	24214	22645	20772	15402	14461	13780	11954	12204
Rarawai	P	3574	2899	3164	1055	1127	1038	1078	1370	665
	R	14805	17360	14613	17585	14553	14102	12441	11291	12206
	Total	18379	20259	17777	18640	15680	15140	13519	12661	12871
Labasa	P	2512	3120	2597	1269	1116	990	1086	2065	559
	R	17181	19604	18348	15911	14039	14150	12888	12389	12799
	Total	19693	22724	20945	17180	15155	15140	13974	14454	13358
Penang	P	1396	1386	1120	542	339	272	220	522	158
	R	5029	4958	4674	4568	3991	3990	3434	3265	3367
	Total	6425	6344	5794	5110	4330	4262	3654	3787	3525
All mills	P	11489	11039	9825	3908	3369	3188	3067	5300	1661
	R	56758	62502	57336	57794	47197	45815	41860	37556	40298
	Total	68247	73541	67161	61702	50567	49003	44927	42856	41959

Appendix 7: Tonnes of cane harvested

Mills	Average for period of five seasons					Last four seasons individually			
	1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	1048942	1283569	1216597	971454	763321	726046	527663	652333	481483
Rarawai	1006366	1017374	957507	878509	738316	659351	522114	663774	508638
Labasa	1015166	1166055	1017061	840388	695728	679584	554575	570468	413285
Penang	332592	291206	309205	239044	213253	181650	175701	208860	143568
All mills	3403066	3758204	3500370	2929395	2410619	2246631	1780053	2095435	1546974

Appendix 8: Tonnes of cane per hectare harvested

Mills	Crop	Average for period of five seasons					Last four seasons individually			
		1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	P	65.4	64.7	64.2	63.9	67.2	64.9	57.9	68.1	53.9
	R	54.2	51.2	51.4	45.9	47.6	49.2	37.3	52.9	39.1
	Total	55.5	52.4	53.7	46.8	49.1	50.2	38.3	54.6	39.5
Rarawai	P	64.3	61.2	62.1	59.6	58.8	59.4	48.7	62.6	53.1
	R	52.0	48.1	52.9	46.4	44.8	42.4	37.7	51.2	38.8
	Total	54.2	50.1	53.9	47.1	46.5	43.6	38.6	52.4	39.5
Labasa	P	58.9	59.3	56.5	59.7	56.7	56.1	50.6	46.7	43.9
	R	51.5	50.4	47.4	47.6	43.5	44.1	38.8	38.3	30.4
	Total	51.5	51.3	48.6	48.9	45.8	44.9	39.7	39.5	30.9
Penang	P	63.1	57.2	62.6	54.2	56.3	48.6	54.9	53.3	46.4
	R	48.6	43.1	51.2	46.4	48.3	42.2	47.6	55.5	40.5
	Total	51.1	46.0	53.3	46.8	49.1	42.6	48.1	55.2	40.7
All Mills	P	62.6	61.2	61.8	58.3	59.5	59.0	51.9	56.9	49.5
	R	55.8	48.1	50.0	46.0	45.8	44.9	38.7	47.8	36.3
	Total	53.3	50.2	52.1	47.5	47.3	45.8	39.6	48.9	36.9

Appendix 9: Hectares harvested in relation to registered area and cultivated area (ha)					
Mills	Area (ha)			% of area harvested	
	Registered	Cultivated	Harvested	Registered	Cultivated
Lautoka	22272	14570	12204	54.8	83.8
Rarawai	21569	19829	12871	59.7	64.9
Labasa	18385	15438	13358	72.7	86.5
Penang	7824	4054	3525	45.1	87.0
Total	70049	53891	41958	59.9	77.9

Appendix 10: Plant cane harvested as percentage of total cane harvested									
Mills	Average for period of five seasons					Last four seasons individually			
	1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	17	15	13	5	5.5	6	7.5	14	3.1
Rarawai	19	14	18	6	8.2	7	10.1	12.9	6.9
Labasa	13	14	12	7	8.2	7	9.9	16.9	5.9
Penang	22	23	19	11	8.2	6	6.9	13.3	5.1
All mills	17	16	15	7	7.4	7	8.9	14.4	5.3

Appendix 11: Plant, ratoon yields and percentage of total area harvested - 2012 Crop											
Mills	Plant			First ratoon			Other ratoons			All cane	
	tch	Area ha	% of Area	tch	Area ha	% of Area	tch	Area ha	% of Area	tch	Area ha
Lautoka	53.9	279	2.3	45.3	1220	10.0	38.4	10704	87.7	39.5	12204
Rarawai	53.1	665	5.2	47.8	1339	10.4	37.7	10866	84.4	39.5	12871
Labasa	43.9	559	4.2	42.1	1896	14.2	28.3	10904	81.6	30.9	13356
Penang	46.4	158	4.5	46.8	533	15.1	39.3	2834	80.4	40.7	3525
All Mills	49.5	1661	4.0	44.9	4988	11.9	35.1	35308	84.2	36.9	41959

Appendix 12: Seasonal %POCS in cane									
Mills	Rough average for period of five seasons					Last four seasons individually			
	1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	12.0	12.5	11.4	11.5	10.8	10.2	10.9	9.6	10.66
Rarawai	12.1	12.9	11.4	11.9	10.9	NA	9.6	9.8	10.65
Labasa	12.4	12.1	11.1	11.5	10.7	10.8	10.0	10.0	11.64
Penang	12.2	12.6	11.1	11.9	11.1	NA	10.6	9.6	11.53
All Mill Avg.	12.3	12.5	11.2	11.7	11.0		10.9	9.8	11.12

Aftermath of the 2012 flood

Appendix 13: Weekly POCS in cane 2012 season					
Week no.	Week ending	Lautoka	Rarawai	Labasa	Penang
1	2-Jul-12	11.34	9.94	12.71	9.75
2	9-Jul-12	10.94	10.29	11.45	10.71
3	16-Jul-12	11.13	10.52	12.1	10.95
4	23-Jul-12	11.31	10.75	11.68	11.19
5	30-Jul-12	10.93	11.15	11.51	11.98
6	6-Aug-12	10.44	11.46	11.52	11.25
7	13-Aug-12	10.71	11.61	11.94	12.26
8	20-Aug-12	10.95	11.44	11.8	11.60
9	27-Aug-12	11.42	11.63	11.53	11.59
10	3-Sep-12	11.45	11.48	11.27	11.93
11	10-Sep-12	11.19	11.45	11.68	11.83
12	17-Sep-12	11.53	11.06	11.73	11.76
13	24-Sep-12	11.35	10.74	11.75	11.80
14	1-Oct-12	10.90	10.96	11.43	11.76
15	8-Oct-12	11.19	10.89	11.29	11.8
16	15-Oct-12	10.78	10.66	11.55	11.76
17	22-Oct-12	10.80	10.57	10.51	11.83
18	29-Oct-12	10.14	10.54		11.41
19	5-Nov-12	9.49	10.03		11.02
20	12-Nov-12	9.72	9.79		
21	19-Nov-12	9.68	7.89		
22	26-Nov-12	8.92	8.69		
23	3-Dec-12	9.28	9.16		
Season Average		10.66	10.65	11.64	11.52

Appendix 14: Sugar produced (tonnes 94 N.T. equivalent)								
Mills	Tonnes sugar 94 N.T. equivalent							
	2005	2006	2007	2008	2009	2010	2011	2012
Lautoka	97315	96875	75656	77311	53313	43384	50306	48129
Rarawai	84258	106781	78786	63954	42222	31580	61028	45732
Labasa	90347	83970	68255	53160	57548	40943	45146	45398
Penang	24733	30937	21858	23231	22818	18530	16838	19908
All mills	296653	318563	244555	217656	175901	134436	173318	159166

Appendix 15: Sugar tonnes 94 N.T. equivalent per hectare (tsh)									
Mills	Average for period of five seasons					Last four seasons individually			
	1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	6.55	6.15	5.61	4.92	4.42	3.69	3.15	4.21	3.8
Rarawai	6.36	6.29	5.61	5.38	4.02	2.79	2.34	4.82	3.8
Labasa	6.20	6.00	4.95	4.97	3.98	3.80	2.93	3.05	3.4
Penang	5.70	5.47	5.42	4.65	5.41	5.35	5.07	4.45	5.6
Average	6.28	6.05	5.39	5.06	4.25	3.59	2.99	4.04	4.2

Appendix 16: Length of season (weeks) - Start and finish of crushing (date)									
Mills	Average length of season (5 yearly)					Last four seasons individually			
	1986/ 1990	1991/ 1995	1996/ 2000	2001/ 2005	2006/ 2010	2009	2010	2011	2012
Lautoka	28.8	28.0	29.7	27.6	27.0	31.4	23.3		24.2
						22 Jun to 25 Jan 2010	24 Jun to 04 Dec 2010		26 Jun to 04 Dec 2012
Rarawai	26.2	25.3	26.5	24.2	28.0	31.5	28.0	26.6	22.8
						03 Jul to 03 Feb 2010	28 Jun to 11 Jan 2011	21 Jun to 24 Dec 2011	10 Jul to 17 Dec 2012
Labasa	26.6	29.4	30.7	24.1	25.9	25.6	28.1	22.7	16.1
						09 Jun to 18 Dec 2009	22 Jun to 29 Dec 2010	14 Jul to 20 Dec 2011	26 Jun to 16 Oct 2012
Penang	25.5	21.5	26.2	20.4	22.5	22.4	24.6	24.6	16.3
						19 May to 22 Oct 2009	06 Jun to 20 Nov 2010	28 Jun to 28 Nov 2011	26 Jun to 18 Oct 2012
All mills	26.8	26.1	28.2	24.1	25.9	28.3	23.3		19.9

Appendix 17: Varieties Percent of hectares harvested										
Varieties	Lautoka		Rarawai		Labasa		Penang		All Mills	
Area (ha)										
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Ragnar	0.40	0.37	0.20	0.36	16.20	23.87	0.20	0.06	4.60	6.60
Waya	nil	nil	0.10	0.27	7.40	8.04	0.20	0.10	2.05	2.20
Mali	nil	nil	nil	nil	13.70	11.13	nil	0.27	3.75	3.00
Galoa	0.10	0.04	nil	nil	9.20	4.31	nil	nil	2.52	1.20
Aiwa	0.40	0.36	0.20	0.15	0.40	0.22	nil	0.01	0.30	0.20
Kiuva	0.40	0.52	0.10	0.16	nil	0.11	nil		0.15	0.20
Mana	93.90	94.50	93.90	93.14	nil	nil	98.80	98.28	68.80	69.20
LF91-1925	0.50	0.54	0.10	0.03	0.30	0.48	nil		0.26	0.30
Kaba	2.80	2.18	4.00	4.40	0.30	0.21	0.20	0.23	2.22	2.20
Vatu	nil	nil	nil	nil	16.20	16.77	nil	0.05	4.41	4.50
Beqa	nil	0.02	nil	nil	0.10	0.05	nil		0.03	nil
Naidiri	1.00	1.07	1.20	1.26	35.5	33.69	0.60	0.86	10.42	9.80
Exp.	nil	nil	nil	nil	nil	nil	0.10	0.14		nil
Other var.	0.50	0.40	0.20	0.22	0.90	1.13	nil		0.48	0.50

Appendix 18: Area planted in hectares as % of registered and cultivated areas						
Mills	Hectares planted		Hectares planted as % of registered area		Hectares planted as % of cultivated area	
	2011	2012	2011	2012	2011	2012
Lautoka	297	625	1.3	2.8	2.1	4.3
Rarawai	746	904	3.2	4.2	3.7	4.6
Labasa	772	1845	4.3	10.0	4.6	12.0
Penang	208	344	2.3	4.4	3.6	8.5
Total	2023	3718	2.8	5.3	6.3	6.9

Appendix 19: Percentage of total area planted by different varieties over three years											
Year	Varieties	Lautoka		Rarawai		Labasa		Penang		All mills	
		%	Area ha	%	Area ha	%	Area ha	%	Area ha	%	Area ha
2010	Ragnar	0.40	1698	0.30	1623	16.60	2357	0.10	792	3.40	6470
2011		0.50	297	0.70	746	12.20	772			5.00	2023
2012		1.20	625	0.70	904	17.60	1845			9.10	3718
2010	Waya	-		0.60	1623	7.00	2357	-		4.00	6470
2011				1.00	746	11.70	772			4.80	2023
2012				0.10	904	9.40	1845	39.10	344	8.30	3718
2010	Mana	85.30	1698	83.20	1623	-		61.80	792	60.20	6470
2011		79.00	297	86.30	746	1.60	772	98.70	208	54.20	2023
2012		76.00	625	79.20	904			51.00	344	36.80	3718
2010	Galoa	0.06	1698	-		5.40	2357	-		3.50	6470
2011						7.70	772			2.90	2023
2012		0.10	625			6.50	1845			3.20	3718
2010	Vatu	0.20	1698	-		7.70	2357	-		4.00	6470
2011						8.90	772			3.40	2023
2012						18.50	1845	0.20	344	9.20	3718
2010	Mali	-		0.05	1623	11.80	2357	0.30	792	3.50	6470
2011		0.10	297			13.30	772	0.30	208	5.10	2023
2012						10.70	1845	0.20	344	5.30	3718
2010	Aiwa	0.34	1698	0.10	1623	0.30	2357	-		0.10	6470
2011		0.20	297			0.20	772			0.10	2023
2012		1.30	625	0.20	904	0.10	1845	0.30	344	0.30	3718
2010	Beqa	0.02	1698	-		0.20	2357	-			
2011											
2012		0.40	625					0.30	344	0.10	3718
2010	Kaba	2.50	1698	4.10	1623	0.20	2357	0.50	792	1.90	6470
2011		4.70	297	6.90	746	0.30	772			3.30	2023
2012		5.70	625	10.50	904	0.40	1845	1.60	344	3.90	3718
2010	Naidiri	1.36	1698	1.20	1623	27.00	2357	3.40	792	17.90	6470
2011		2.70	297	1.70	746	42.40	772			17.20	2023
2012		4.40	625	1.40	904	32.70	1845	7.30	344	18.00	3718
2010	Kiuva	0.03	1698	-		-		-		0.40	6470
2011				1.50	746					0.70	2023
2012											
2010	LF91-1925	0.27	1698	0.02	1623	1.30	2357	-		0.50	6470
2011				0.90	746					1.50	2023
2012											
2010	Experiment	0.23	1698	0.20	1623	0.50	2357	0.10	792	0.70	6470
2011	Other Varieties	3.70	297	1.00	746	1.80	772	1.00	208	1.70	2023
2012		10.80	625	8.10	904	4.10	1845			5.80	3718

Appendix 20: Cane transport in Fiji (tonnes of cane harvested and actual method of delivery)									
Mills	Year	Delivered portable line		Winch trailer or lorry to mainline		Lorry direct to mill carrier		Total	
		Tonnes	% of Total	Tonnes	% of Total	Tonnes	% of Total	Tonnes	% of Total
Lautoka	2005	16695	2.0	202130	23.0	671954	75.0	890779	100
	2006	11854	1.0	174057	17.0	865186	82.0	1051097	100
	2007	13652	2.0	158002	21.0	569577	77.0	741231	100
	2008	15915	2.0	179905	24.0	574754	74.0	770567	100
	2009	12464	2.0	168852	23.0	544730	75.0	726046	100
	2010	3964	1.0	129410	25.0	394094	75.0	527468	100
	2011	9491	1.5	144569	22.2	498273	76.4	652333	100
	2012	2065	0.4	113819	23.6	365599	75.9	481483	100
Rarawai	2005	40601	5.0	223857	29.0	497246	66.0	761704	100
	2006	44731	4.0	239872	23.0	754871	73.0	1039474	100
	2007	32927	5.0	184605	25.0	520946	70.0	738478	100
	2008	38797	5.0	184094	25.0	509470	70.0	732165	100
	2009	23827	4.0	164490	25.0	471034	71.0	659351	100
	2010	25106	5.0	126450	24.0	370460	71.0	522016	100
	2011	23586	3.6	332792	50.1	307396	46.3	663774	100
	2012	14772	3.6	106393	24.9	387485	71.4	508650	100
Labasa	2005	18563	2.0	249669	27.0	642431	71.0	910663	100
	2006	3391	1.0	238591	27.0	629049	72.0	871031	100
	2007	2910		233371	31.0	532847	69.0	769138	100
	2008	1275		179815	30.0	423224	70.0	604314	100
	2009			230735	34.0	448849	66.0	679584	100
	2010			171042	34.0	383485	66.0	554527	100
	2011	nil	nil	162856	29.0	407610	71.0	570466	100
	2012	840	0.2	117543	28.4	294902	71.4	413285	100
Penang	2005	1191	5.0	38421	17.0	175260	78.0	225594	100
	2006	3681	1.0	63499	24.0	197318	75.0	264498	100
	2007	3010	1.0	55450	24.0	171378	75.0	229838	100
	2008	3026	1.0	48285	23.0	163261	76.0	214572	100
	2009	11145	6.0	30977	17.0	139528	77.0	181650	100
	2010			44447	25.0	131254	75.0	175701	100
	2011	nil	nil	55422	26.5	153438	73.5	208860	100
	2012			38712	27.0	104856	73.0	143568	100
All mills	2005	87772	3.0	714077	26.0	1986891	71.0	2788740	100
	2006	63657	2.0	716019	22.0	2446424	76.0	3226100	100
	2007	52509	2.0	128061	16.0	2298115	82.0	2478685	100
	2008	59013	3.0	592099	26.0	1670704	72.0	2321620	100
	2009	47436	2.0	595054	26.0	1604141	71.0	2246631	100
	2010	29070	1.6	471349	26.5	1279293	72.0	1779712	100
	2011	33077	1.6	695639	33.2	1366717	65.2	2095433	100
	2012	17677	1.1	376467	24.3	1152842	74.5	1546986	100

Appendix 21: Percentage burnt cane of total tonnes crushed

Year	Lautoka		Rarawai		Labasa		Penang		Average	
	%	Total	%	Total	%	Total	%	Total	%	Total
1975	18.2	752094	29.1	731917	3.6	485290	14.1	156624	16.3	2,125,925
1976	12.9	917428	28.0	731865	4.9	445798	15.1	154116	15.2	2,249,027
1977	17.7	1044468	28.9	825628	6.9	606154	11.8	198116	16.3	2,674,366
1978	19.1	1043064	25.3	799497	9.6	756793	8.2	250168	15.6	2,849,522
1979	14.9	1699234	25.9	1123509	9.6	940636	15.0	294605	16.4	4,057,984
1980	21.5	1348039	27.4	958414	16.0	782742	18.0	271096	20.7	3,360,291
1981	17.6	1444504	21.2	1248910	19.4	930265	17.0	307753	18.8	3,931,432
1982	23.2	1507831	24.8	1100133	13.6	1140552	13.2	326348	18.7	4,074,864
1983	18.3	639823	18.4	561774	18.0	761454	12.0	239482	16.7	2,202,533
1984	25.1	1731580	8.2	1146140	12.9	1136737	10.0	382030	14.1	4,396,487
1985	28.6	947593	25.2	864264	22.4	934166	16.2	296418	23.1	3,042,441
1986	29.5	1526648	15.1	1204661	15.1	1017372	11.3	360284	17.8	4,108,965
1987	23.8	1090111	34.2	685994	20.9	877652	19.0	306706	24.5	2,960,463
1988	37.7	1116916	15.2	742128	16.0	1034788	19.2	291440	22.0	3,185,272
1989	20.6	1537337	13.6	1250977	12.7	974201	10.0	336418	14.2	4,098,933
1990	24.3	1347531	30.4	1148070	13.7	1171817	14.6	348110	20.8	4,015,528
1991	42.5	1112957	46.4	961961	32.0	1029223	27.6	276261	37.1	3,380,402
1992	52.5	1109778	52.1	962936	44.4	1162108	41.1	297818	47.5	3,532,640
1993	35.6	1341537	33.4	1013627	29.2	1124357	19.4	224383	29.4	3,703,904
1994	39.0	1337977	36.0	1104246	27.0	1298285	19.8	323743	30.5	4,064,251
1995	43.4	1515880	42.5	1044098	37.6	1216290	28.7	333790	38.1	4,110,058
1996	54.8	1561446	48.1	1229978	39.9	1238443	33.2	349348	44.0	4,379,215
1997	50.7	1160879	49.1	906495	33.5	910137	34.8	302095	42.0	3,279,606
1998	67.0	625763	67.7	406811	54.5	832622	44.6	232825	58.5	2,098,021
1999	41.6	1433143	39.8	992968	17.0	1192735	26.3	339292	32.4	3,958,138
2000	56.1	1301752	54.6	1251282	37.8	911370	49.0	322475	50.6	3,786,879
2001	56.7	906743	50.3	844411	18.9	845444	49.5	208183	42.9	2,804,781
2002	46.8	1137123	41.8	1071579	21.4	938450	33.9	275431	37.1	3,422,583
2003	40.1	890499	32.8	836728	29.3	638851	22.0	243602	33.4	2,609,680
2004	42.7	1032127	39.5	878121	18.3	848533	35.5	242408	34.3	3,001,189
2005	44.4	890779	38.4	761704	25.0	910663	34.9	225594	35.7	2,788,740
2006	60.5	1051097	58.5	1039474	34.4	871031	46.5	264498	51.7	3,226,100
2007	39.0	741231	40.5	738478	39.1	769138	53.5	229844	40.8	2,478,691
2008	50.9	770569	53.6	732165	49.1	604314	48.5	214572	51.1	2,321,620
2009	43.5	726046	33.3	659351	18.6	679584	28.8	181650	31.8	2,246,631
2010	30.4	527663	33.6	522114	18.6	554575	16.3	175701	25.0	1,780,053
2011	28.5	652333	28.2	663774	17.9	570468	26.6	208860	25.3	2,095,435
2012	43.8	481483	44.7	508638	18.7	413285	28.3	143568	35.9	1,546,974

APPROVED VARIETIES

The list of sugarcane varieties approved for planting during 2011 has been revised to include maturity trend. Varieties that are no longer planted have been removed from the approved varieties list. The varieties are recommended to growers on their soil type. The growers have a choice of at least three varieties to plant on their farms as laid down in the Master Award.

Mill/Sectors	Soil types	Varieties recommended on maturity trends	
		Early – mid maturing	Mid – late maturing
Lautoka/Olosara	Rich alluvial soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Cuvu	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana
Lautoka/Lomawai	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Lautoka/Yako	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Lautoka/Nawaicoba	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Lautoka/Malolo	Flat Fertile soil	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Qeleloa	Rich alluvial soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Meigunyah	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Legalega	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Natova	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Lautoka/Lautoka	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana

Mill/Sectors	Soil types	Varieties recommended on maturity trends	
		Early – mid maturing	Mid – late maturing
Lautoka/Saweni	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Lautoka/Lovu	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Lautoka/Drasa	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Sandy soils	LF91-1925	Kaba, Mana, Galoa
Rarawai/Varoko	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Mota	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Naloto	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Koronubu	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Veisaru	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Rarawai	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Varavu	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Tagitagi	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Mana, Kaba, Vatu
	Poor soils	LF91-1925	Kaba, Mana
	Saline areas	Naidiri, LF91-1925	Kaba, Mana, Galoa
Rarawai/Yaladro	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
Rarawai/Drumasi	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Mana, Kaba, Vatu
	Poor soils	LF91-1925	Kaba, Mana
	Saline areas	Naidiri, LF91-1925	Kaba, Mana, Galoa

Mill/Sectors	Soil types	Varieties recommended on maturity trends	
		Early – mid maturing	Mid – late maturing
Labasa/Waiqele	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	Naidiri, LF91-1925	Kaba, Mali
Labasa/Wailevu	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	Naidiri, LF91-1925	Kaba, Mali
	Saline soils	Naidiri, LF91-1925	Galoa, Vatu
Labasa/Vunimoli	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	Naidiri, LF91-1925	Kaba, Mali
Labasa/Labasa	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	Naidiri, LF91-1925	Kaba, Mali
	Saline soils	Naidiri, LF91-1925	Galoa, Vatu, Mali
Labasa/Bucaisau	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva, Waya
	Poor soils	Naidiri, LF91-1925	Kaba, Waya, Mali
	Saline soils	Naidiri, LF91-1925	Galoa, Vatu, Mali
Labasa/Wainikoro	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva, Waya
	Poor soils	Naidiri, LF91-1925	Kaba, Waya, Mali
	Saline soils	Naidiri, LF91-1925	Galoa, Vatu, Mali
Labasa/Daku	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva, Waya
	Poor soils	Naidiri, LF91-1925	Kaba, Waya, Mali
Labasa/Natua	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali
Labasa/Solove	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali
Labasa/Bulivou	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali
Penang/Nanuku	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva
	Poor soils	LF91-1925	Kaba, Mana
	Salt affected areas	Naidiri, LF91-1925	Galoa
	Viti Vanua area	Naidiri, LF91-1925	Mana, Kaba, Kiuva, Mali
Penang/Malau	Rich alluvial soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva, Mali
	Poor soils	LF91-1925	Kaba, Mana
	Salt affected areas	Naidiri, LF91-1925	Galoa
Penang/Ellington	Flat Fertile soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Kiuva
	Medium soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Vatu, Kiuva, Mali
	Poor soils	LF91-1925	Kaba, Mana
	Salt affected areas	Naidiri, LF91-1925	Galoa

Sugar Reseach Institute of Fiji

Financial Statements

For the year ended 31 December 2012

Sugar Reseacrh Institute of Fiji

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Sugar Research Institute of Fiji

Directors' report

In accordance with a resolution of the Board of Directors, the Directors herewith submit the statement of financial position of Sugar Research Institute of Fiji (the "Institute") as at 31 December 2012 and the related statement of profit or loss and other comprehensive income and statement of cash flows for the year ended on that date and report as follows:

Directors

The Directors in office during the year and at the date of this report are:

	Date of end term	Date appointed
Dr John Morrison - Chairman	30/09/2012	
Sundresh Chetty	30/09/2012	
Viliame Gucake	30/09/2012	
Dr. Krishnamurthi	30/09/2012	
Suresh Patel	30/09/2012	
Mangaiya Reddy	30/09/2012	
Seru Vularika	30/09/2012	
Professor Rajesh Chandra - Chairman		13/02/2015
Dr K.S Shanmugha Sundaram		13/02/2015
Professor Paras Nath		13/02/2015
Mr Daniel Elisha		13/02/2015
Mr Abdul Khan		13/02/2015
Mr Sundresh Chetty		13/02/2015
Mr Manasa Tagicakibau		13/02/2015

The Institute did not have a Board present from the period 30/09/2012 to 04/05/2014.

The current Chairman and members of the Board were not responsible for the affairs of the Institute in 2012. Only one member of the Board continued from the 2012 Board to the current Board. The Board has taken all necessary steps to have the accounts prepared properly with external input and has ensured that the external auditors have had unfettered access to all documents and information sought by them with the shared aim to ensure that the final accounts represent the true state of affairs of the Institute in 2012, including any liabilities.

State of affairs

In the opinion of the Board the accompanying statement of financial position gives a true and fair view of the state of affairs of the Institute as at 31 December 2012 and the accompanying statement of profit or loss and other comprehensive income and statement of cash flows give a true and fair view of the results and cash flows of the Institute for the year then ended.

Principal activity

The functions of the Institute are outlined under the Sugar Research Institute of Fiji Act No 14 of 2005, which includes promoting by means of research and investigation, the technical advancement, efficiency and productivity of the sugar industry, and to provide its functions, powers, administration and finance and for related matters.

Current assets

The Directors took reasonable steps before the Institute's financial statements were made out to ascertain that the current assets of the Institute were shown in the accounting records at a value equal to or below the value that would be expected to be realised in the ordinary course of business.

At the date of this report, the Directors are not aware of any circumstances which would render the values attributable to the current assets in the financial statements to be misleading.

Sugar Research Institute of Fiji

Directors' report (continued)

Receivables

The Directors took reasonable steps before the Institute's financial statements were made out to ascertain that all known bad debts were written off and adequate allowance was made for impairment losses.

At the date of this report, the Directors are not aware of any circumstances which would render the above assessment inadequate to any substantial extent.

Related party transactions

All related party transactions have been adequately recorded in the financial statements.

Receivables

The Directors took reasonable steps before the Institute's financial statements were made out to ascertain that all known bad debts were written off and adequate allowance was made for impairment losses.

At the date of this report, the Directors are not aware of any circumstances which would render the above assessment inadequate to any substantial extent.

Related party transactions

All related party transactions have been adequately recorded in the financial statements.

Other circumstances

At the date of this report, the Directors are not aware of any circumstances not otherwise dealt with in this report or financial statements which would render any amounts stated in the accounts to be misleading.

Unusual circumstances

The results of the Institute's operations during the financial year have not in the opinion of the Directors been substantially affected by any item, transaction or event of a material and unusual nature other than those disclosed in the financial statements.

Going concern

The Directors believe that the basis of preparation of accounts is appropriate and the Institute will be able to continue in operation for at least 12 months from the date of this statement.

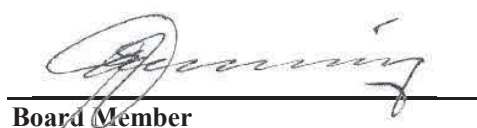
Events subsequent to balance date

There has not arisen in the interval between the end of the year and the date of this report any item, transaction or event of a material and unusual nature likely, in the opinion of the Directors, to affect significantly the operations of the Institute, the results of those operations or the state of affairs of the Institute in subsequent financial years.

Dated at Lautoka this 28th day of April 2017.

Signed in accordance with a resolution of the Board.


Chairman


Board Member



Honourable Commodore Josaia Voreqe Bainimarama
Minister responsible for the Sugar Industry
PO Box 2212
Government Buildings
Suva

Dear Minister,

INDEPENDENT AUDITOR'S REPORT TO THE BOARD MEMBERS OF SUGAR RESEARCH INSTITUTE OF FIJI

Report on the financial statements

We have audited the accompanying financial statements of Sugar Research Institute of Fiji, which comprise the statement of financial position as at 31 December 2012, the statement of comprehensive income, and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory notes as set out in notes 1 to 19.

Directors' and Management's Responsibility for the Financial Statements

Directors and management are responsible for the preparation of financial statements that give a true and fair view in accordance with International Financial Reporting Standards and for such internal control as the directors and management determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation of financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Basis of qualification

VAT payable

The financial statements show an amount of VAT payable to the Fiji Government of \$341,558. The VAT status of the Institute is currently being determined with FRCA and it is not presently known what the outcome of this will be. The impact on the amount recorded in the financial statements is currently incapable of determination, and accordingly, we are not able to determine what adjustments, if any, might be necessary to the amounts recorded in the financial statements.



INDEPENDENT AUDITOR'S REPORT TO THE BOARD MEMBERS OF SUGAR RESEARCH INSTITUTE OF FIJI (continued)

Qualified Opinion

In our opinion, the financial statements give a true and fair view of the financial position of Sugar Research Institute of Fiji as at 31 December 2012 and of its financial performance, its changes in equity and its cash flows for the year then ended in accordance with International Financial Reporting Standards.

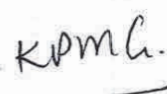
Report on Other Legal and Regulatory Requirements

We have obtained all the information and explanations which, to the best of our knowledge and belief, were necessary for the purposes of our audit.

In our opinion;

- (i) proper books of account have been kept by the Institute, so far as it appears from our examination of those books;
- (ii) the financial statements are in agreement with the books of account; and
- (iii) to the best of our information and according to the explanations given to us the financial statements give the information required by the Sugar Research Institute of Fiji Act, 2005 in the manner so required.

28th April, 2013
Nadi, Fiji


KPMG
Chartered Accountants

Sugar Research Insitute of Fiji
Statement of profit or loss and other comprehensive income
For the year ended 31 December 2012

	Note	2012 \$	2011 \$
Contributions and grants	5	2,473,084	899,948
Estate income		1,016,461	825,001
Other income		-	966,375
Total income		3,489,545	2,691,324
Cost of operations	6	(1,552,346)	(1,479,074)
Administrative expenses	7	(1,945,588)	(1,261,810)
Deficit from operations		(8,389)	(49,560)
Finance income	9	8,389	-
Deficit before tax		-	(49,560)
Income tax benefit	10	-	49,560
Deficit for the year		-	-

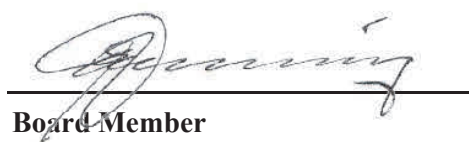
The notes on pages 8 to 14 are an integral part of these financial statements.

Sugar Research Insitute of Fiji
Statement of financial position
As at 31 December 2012

	Note	2012 \$	2011 \$
Assets			
Current assets			
Cash and cash equivalents	12	3,209,184	1,691,827
Inventories		1,311	1,311
Receivables and prepayments	13	19,991	13,292
Receivable from related parties	17(b)	4,813,861	5,495,366
Total current assets		<u>8,044,347</u>	<u>7,201,796</u>
Non-current assets			
Property, plant and equipment	11	<u>3,751,725</u>	<u>3,270,397</u>
Total non-current assets		<u>3,751,725</u>	<u>3,270,397</u>
Total assets		<u>11,796,072</u>	<u>10,472,193</u>
Liabilities			
Current liabilities			
Deferred income	14	7,708,571	6,435,861
Payable to related parties	17(c)	3,595,739	3,595,739
Employee benefits	15	43,023	36,831
Trade and other payables	16	448,739	403,762
Total current liabilities		<u>11,796,072</u>	<u>10,472,193</u>
Total liabilities		<u>11,796,072</u>	<u>10,472,193</u>

Signed for and on behalf of the Board of Directors.


Chairman


Board Member

The notes on pages 8 to 14 are an integral part of these financial statements.

Sugar Research Institute of Fiji
Statement of cash flows
For the year ended 31 December 2012

	Note	2012 \$	2011 \$
Cash flows from operating activities			
Receipts from stakeholders and donors		5,437,067	4,226,087
Payment to suppliers and employees		(3,132,312)	(2,707,020)
Interest received		8,389	-
Net cash from operating activities		<u>2,313,144</u>	<u>1,519,067</u>
Cash flows from investing activities			
Acquisition of property, plant and equipment		<u>(795,787)</u>	<u>(554,869)</u>
Net cash used in investing activities		<u>(795,787)</u>	<u>(554,869)</u>
Net increase in cash and cash equivalents		1,517,357	964,198
Cash and cash equivalents at 1 January		<u>1,691,827</u>	<u>727,629</u>
Cash and cash equivalents at 31 December	12	<u>3,209,184</u>	<u>1,691,827</u>

The notes on pages 8 to 14 are an integral part of these financial statements.

Sugar Research Institute of Fiji

Notes to the financial statements

For the year ended 31 December 2012

1. Reporting entity

Sugar Research Institute of Fiji (the "Institute") is a body corporate domiciled in Fiji, established under the Sugar Research Institute of Fiji Act 2005. The address of the Institute's registered office is Drasa, Lautoka, Fiji.

The functions of the Institute are outlined under Sugar Research Institute of Fiji Act No 14 of 2005, which includes promoting by means of research and investigation, the technical advancement, efficiency and productivity of the sugar industry, and to provide its functions, powers, administration and finance and for related matters.

2. Basis of preparation

(a) Statement of compliance

The financial statements have been prepared in accordance with the International Financial Reporting Standards (IFRS) as adopted by the International Accounting Standards Board (IASB).

The financial statements were authorised for issue by the Board of Directors on 28th April, 2017.

(b) Basis of measurement

The financial statements have been prepared on a historical cost basis except where stated.

(c) Functional and presentation currency

The financial statements are presented in Fijian dollars, which is the Institute's functional currency. All amounts have been rounded to the nearest dollar, unless otherwise indicated.

(d) Use of estimates and judgments

The preparation of financial statements in conformity with IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amount of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised and in any future period affected.

3. Significant accounting policies

The principal accounting policies adopted in the preparation of these financial statements are set out below.

(a) Foreign currency transactions

Transactions in foreign currencies are translated to Fiji dollars at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies at the reporting date are retranslated to Fiji dollars at the exchange rate at that date. The foreign currency gains or losses on translation are recognised in profit or loss.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

3. Significant accounting policies (continued)

(b) Property, plant and equipment

Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and any accumulated impairment losses. Cost includes expenditure that is directly attributable to the acquisition of the asset. Any gain or loss on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and is recognised in profit or loss.

Subsequent costs

The cost of replacing part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefit embodied within the part will flow to the Institute and its cost can be measured reliably. The cost of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

Depreciation

Depreciation is calculated to write off the cost of items of property, plant and equipment less their estimated residual values using the straight-line method over their estimated useful lives, and is recognised in profit or loss. The estimated useful lives of property, plant and equipment for current and comparative periods are as follows:

Buildings and land	80 years
Computers	5 years
Fixtures and fittings	10 years
Motor vehicles	6.67 years
Plant and Equipment	6.67 - 10 years

Depreciation methods, useful lives and residual values are reassessed at reporting date and adjusted if appropriate.

(c) Financial instruments

(i) Non-derivative financial assets

The Institute initially recognises loans and receivables on the date that they are originated. All other financial assets are recognised initially on the trade date at which the Institute becomes a party to the contractual provisions of the instrument.

The Institute derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Institute is recognised as a separate asset or liability.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

3. Significant accounting policies (continued)

(c) Financial instruments (continued)

(i) Non-derivative financial assets (continued)

Financial assets and liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Institute has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Institute classifies non-derivative financial assets into loans and receivables.

Loans and receivables

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are initially measured at fair value plus any directly attributable transaction costs. Subsequent to initial recognition loans and receivables are measured at amortised cost using the effective interest method.

Loans and receivables comprise receivables from related parties, other receivables and cash and cash equivalents.

Cash and cash equivalents

Cash and cash equivalents comprises cash at bank and cash on hand.

(ii) Non-derivative financial liabilities

Financial liabilities are initially recognised on the trade date when the Institute becomes a party to the contractual provisions of the instrument. The Institute derecognises a financial liability when its contractual obligations are discharged or cancelled or expire. Financial liabilities are initially measured at fair value less any directly attributable transaction costs. Subsequent to initial recognition these liabilities are measured at amortised cost using the effective interest method.

The Institute has the following non-derivative financial liabilities: trade and other payables and payable to related parties.

Trade and other payables and payable to related party are stated at amortised cost.

(d) Inventories

Inventories are measured at the lower of cost and net realisable value. The cost of inventories is based on the first-in first-out principle, and includes expenditure incurred in acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition.

Net realisable value is the estimated selling price in the ordinary course of business, less the estimated selling expenses.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

3. Significant accounting policies (continued)

(e) Impairment

(i) Non-derivative financial assets

Financial assets not classified as at fair value through profit or loss are assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that financial assets are impaired includes default or delinquency by a debtor, restructuring of an amount due to the Institute on terms that the Institute would not consider otherwise, indications that a debtor or issuer will enter bankruptcy or the disappearance of an active market for a security because of financial difficulties.

(ii) Non-financial assets

At each reporting date non financial assets are reviewed to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. If estimated recoverable amount is lower, the carrying amount is reduced to its estimated recoverable amount, and an impairment loss is recognised immediately in profit or loss.

(f) Revenue

Grant income

Grants are recognised in the statement of financial position initially as deferred income when there is reasonable assurance that it will be received and that the Institute will comply with the conditions associated with the grant. It is then recognised in the profit or loss as grant income on a systematic basis as related expenses are incurred.

(g) Employee benefits

Superannuation

Obligation for contributions to a defined contribution plan are recognised as an expense in profit or loss when they are due.

Employee entitlements

Liability for annual leave is recognised and measured as the amount unpaid at the reporting date at current pay rates in respect of employee services up to that date.

Short term benefits

Short -term employee benefits obligations are measured on an undiscounted basis and are expensed in profit or loss as the related service is provided.

A liability is recognised for the amount to be paid under short-term benefit if the Institute has a present or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be measured reliably.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

3. Significant accounting policies (continued)

(h) Income tax

The Institute is not subject to income tax.

(i) Receivable from related parties

The amount receivable from related parties are recognised when there is a contractual receivable or a right to receive.

4. Financial risk management

The financial statements do not disclose information relating to the nature and extent of risks arising from financial instruments to which the Institute is exposed at year end, since credit risk, liquidity risk and market risk are not material to the Institute.

5. Contributions and grants

Contributions from stakeholders and grants that compensate the Institute for revenue and capital expenditure are recognised from deferred income as follows:

	2012	2011
	\$	\$
African Caribbean and Pacific Group of States (ACP)	92,072	12,942
Contribution from the Fiji Government	520,972	258,812
European Union	219,085	71,435
Fiji Sugar Corporation (FSC)	1,130,104	249,318
Sugar Cane Growers	507,204	247,801
Mauritius Sugar Research Institue (MISRI)	3,647	59,640
	<u>2,473,084</u>	<u>899,948</u>

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

	2012	2011
	\$	\$
6. Cost of operations		
Advertising	4,699	-
Accounting	7,000	-
Bank charges	4,386	4,809
Depreciation	314,459	288,140
Electricity	43,189	13,704
EU cost	45,580	10,285
General supplies	907	2,937
Communciation expenses	15,048	11,004
Material costs	53,404	94,138
Motor vechicle running expenses	239,310	177,194
Overhead expenses	1,746	820
Postage	674	21
RAF costs	12,818	9,626
Rent	-	3,300
Repairs and maintenances	13,346	24,498
Subcontract expenses	377,423	544,919
Travel	47,800	10,065
Wages and salaries (refer to note 8)	370,557	283,614
	<u>1,552,346</u>	<u>1,479,074</u>
7. Administrative expenses		
Auditors remuneration - audit	8,085	7,200
- other services	19,988	8,878
Accommodation and meals	16,871	29,008
ACP cost	92,072	11,127
Board fees	61,743	35,875
CEO donation	-	1,250
CEO security	9,355	4,680
Consultanties	-	41,092
Electricity	9,836	13,681
Fees- Science Audit Committee	-	1,650
Fiji National Provident Fund contributions	68,401	48,489
FSC costs	621,004	562,102
General expenses	71,937	2,249
Hire of services	248,565	16,263
ICT consumables	7,690	4,979
ICT license	9,125	14,879
Communication expenses	7,798	17,740
Balance carried forward	<u>1,252,470</u>	<u>821,142</u>

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

	2012	2011
	\$	\$
7. Administrative expenses (continued)		
Balance brought forward	1,252,470	821,142
Industrial relations expense	-	410
Insurance	46,642	37,326
Legal fees	-	3,742
Medical expense	4,557	18,032
Media and publication	5,254	4,950
MISRI Cost	3,647	54,794
Freight	25,386	28,831
Rent	45,946	28,793
Repairs and maintenance	3,911	5,780
Stationery	6,532	6,724
Subscriptions	650	3,485
Training	7,821	2,451
Training and Productivity Authority of Fiji	8,550	4,647
Travel	13,343	41,341
Tuition fees	5,677	3,808
Visa permit	3,246	1,080
Water	3,388	9,362
Wages and salaries (refer to note 8)	508,568	185,112
	<u>1,945,588</u>	<u>1,261,810</u>
8. Personnel expenses		
Fiji National Provident Fund contributions	68,401	48,489
Training and Productivity Authority of Fiji	8,550	4,647
Key management compensation - short term benefits	145,589	143,449
Wages and salaries	733,536	325,277
	<u>956,076</u>	<u>521,862</u>

The average number of staff during the year was 71 (2011: 70).

9. Finance income

Interest received	<u>8,389</u>	<u>-</u>
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- 10.** In 2012 the Fiji Revenue and Customs Authority confirmed that the entity is not subject to income tax and the 2010 income tax expense was reversed in 2011.

Sugar Research Insitute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

11. Property, plant and equipment

	Land & building	Fixtures & fittings	Plant & equipment	Motor vehicles	Computers	Work in progress	Total
	\$	\$	\$	\$	\$	\$	\$
Cost							
Balance at 1 January 2011	-	43,932	709,351	1,051,735	243,157	1,647,398	3,695,573
Acquisitions	-	-	137,848	-	-	417,021	554,869
Transferred during the year	1,449,244	-	-	-	-	(1,449,244)	-
Balance as at 31 December 2011	1,449,244	43,932	847,199	1,051,735	243,157	615,175	4,250,442
Acquisitions	238,031	-	417,839	-	-	139,917	795,787
Transferred during the year	615,175	-	-	-	-	(615,175)	-
Balance as at 31 December 2012	2,302,450	43,932	1,265,038	1,051,735	243,157	139,917	5,046,229
							-
Depreciation							
Balance at 1 January 2011	-	6,195	129,994	443,495	112,221	-	691,905
Depreciation charge	21,916	4,394	70,779	142,422	48,629	-	288,140
Balance at 31 December 2011	21,916	10,589	200,773	585,917	160,850	-	980,045
Depreciation charge	23,807	4,393	97,960	142,419	45,880	-	314,459
Balance at 31 December 2012	45,723	14,982	298,733	728,336	206,730	-	1,294,504
Carrying amount							
At 31 December 2010	-	37,737	579,357	608,240	130,936	1,647,398	3,003,668
At 31 December 2011	1,427,328	33,343	646,426	465,818	82,307	615,175	3,270,397
At 31 December 2012	2,256,727	28,950	966,305	323,399	36,427	139,917	3,751,725

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

	2012	2011
	\$	\$
12. Cash and cash equivalents		
Cash at bank	3,209,145	1,691,504
Cash on hand	39	323
Cash and cash equivalents in the statement of cash flows	<u>3,209,184</u>	<u>1,691,827</u>
13. Receivables and prepayments		
Other receivables	12,992	12,992
Prepayments	6,999	300
	<u>19,991</u>	<u>13,292</u>
14. Deferred income		
Balance at the beginning of the year	6,435,861	3,736,273
Funds received or receivable during the period	3,745,795	3,599,536
Utilised during the period	(2,473,085)	(899,948)
Balance at 31 December	<u>7,708,571</u>	<u>6,435,861</u>
This is comprised as follows:		
Contribution from stakeholders	4,301,027	4,218,463
European Union grant	2,505,127	1,219,262
African Caribbean and Pacific Group of States (ACP)	780,934	873,006
Mauritius Sugar Research Instititue (MISRI)	121,483	125,130
	<u>7,708,571</u>	<u>6,435,861</u>
15. Employee benefits		
Balance at 1 January	36,831	33,060
Provision during the year	23,424	22,738
Provision utilised during the year	(17,232)	(18,967)
Balance at 31 December	<u>43,023</u>	<u>36,831</u>
16. Trade and other payables		
Trade payables	47,103	67,334
Other payables	60,078	48,529
VAT payable	341,558	287,899
	<u>448,739</u>	<u>403,762</u>

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

17. Related parties

Related parties of the Institute include key stakeholders in the Fiji Sugar Industry, namely, the Government of Fiji, Fiji Sugar Corporation, South Pacific Fertilizers Limited, Sugar Cane Growers Fund and Sugar Cane Growers Council.

Transactions with these parties and outstanding balances at year end are disclosed below.

(a) Board members

The following are the Board members of the Institute during the financial year:

	Date of end term	Date appointed
Dr John Morrison - Chairman	30/09/2012	
Sundresh Chetty	30/09/2012	
Viliame Gucake	30/09/2012	
Dr. Krishnamurthi	30/09/2012	
Suresh Patel	30/09/2012	
Mangaiya Reddy	30/09/2012	
Seru Vularika	30/09/2012	
Professor Rajesh Chandra - Chairman		13/02/2015
Dr K.S Shanmugha Sundaram		13/02/2015
Professor Paras Nath		13/02/2015
Mr Daniel Elisha		13/02/2015
Mr Abdul Khan		13/02/2015
Mr Sundresh Chetty		13/02/2015
Mr Manasa Tagicakibau		13/02/2015

The Institute did not have a Board present from the period 30/09/2012 to 04/05/2014.

Board members emoluments and board expenses are disclosed under Note 7.

	2012	2011
	\$	\$
(b) Receivable from related parties		
Fiji Sugar Corporation	3,913,861	4,145,366
Sugar Cane Growers	900,000	1,350,000
	<u>4,813,861</u>	<u>5,495,366</u>

Receivable from related parties are interest free and receivable as and when required.

(c) Payable to related parties

Fiji Sugar Corporation	3,595,739	3,595,739
	<u>3,595,739</u>	<u>3,595,739</u>

Payable to related parties are interest free and payable on demand.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2012

	2012	2011
	\$	\$
17. Related parties (continued)		
(d) Transactions with related parties		
<u>Revenue</u>		
Grant income - Fiji Sugar Corporation	1,130,104	249,318
Grant income - Fiji Government	520,972	258,812
Grant income - Sugar Cane Growers	507,204	247,801
Estate income - Fiji Sugar Corporation	1,016,461	825,001
	<u>3,174,741</u>	<u>1,580,932</u>
<u>Expenses</u>		
Fiji Sugar Corporation costs - expense paid on behalf of SRIF	<u>621,004</u>	<u>562,102</u>

(e) Key management personnel

Key management personnel include the chief executive officer and finance and administration manager of the Institute.

Transactions with key management personnel are no favourable than those available, or which might be reasonably be expected to be available, on similar transactions to third parties on an arm's length.

Key management compensation is disclosed under Note 8.

18. Capital commitments and contingencies

Capital commitments and contingent liabilities as at 31 December 2012 amounted to \$Nil (2011: \$Nil).

19. Events subsequent to balance date

There has not arisen in the interval between the end of the year and the date of this report any item, transaction or event of a material and unusual nature likely, in the opinion of the Directors, to affect significantly the operations of the Institute, the results of those operations or the state of affairs of the Institute in subsequent financial years.



FOR MORE INFORMATION, EMAIL US ON [INFO@SRIF.ORG.FJ](mailto:info@srif.org.fj)

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