SUGAR RESEARCH INSTITUTE OF FIJI









Annual Report 2010

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

SRIF BOARD

The SRIF Board in office for the reporting period was:

Prof. John R. Morrison	Chairman
Dr. Krishnamurthi	Member
Viliame Gucake	Member
Seru Vularika	Member
Sundresh Chetty	Member
Mangaiya Reddy	Member
Suresh Patel	Member
Sanjay N Prakash	Board Secretary

SCIENCE AUDIT COMMITTEE (SAC)

The SAC members during the reporting period were:

Dr. Krishnamurthi	Chairman
Prof. John R. Morrison	Member
Seru Vularika	Member
Sundresh Chetty	Member
Mangaiya Reddy	Member

CHAIRMAN'S REPORT

The year 2010 has seen major advances for SRIF. The independent status of SRIF was confirmed by the government during the year. Significant progress has been made on the construction of new buildings including the new main office at Drasa. Thanks are due to the European Union for supporting this building activity and also for funding several research projects. We have also seen the recruitment of several young staff who will be trained in various aspects of SRIF work. An intensive staff training program has been developed and implemented. In addition to breeding, plant protection and agronomic work, SRIF undertook its first mill audit during 2010.

I would like to acknowledge the work of Mr. Philip Atherton, the first chairman of the SRIF board for the excellent work he did from 2006 – 2009. Unfortunately, due to ill health he was unable continue an active role in the Board. Thanks are also due to the SRIF staff, the sugar industry stakeholders and their representatives, and the Board members for their contributions to the completion of a successful year in 2010.

Professor John Morrison

Chief Executive Officer's Report

The transformation of sugarcane research for development in Fiji warrants a need to "focus on key priorities" as determined and shaped by science, growers, millers and the government". The Institute's plan is to foster collective views on action to improve production through prioritization of sugarcane research and create more relevant and effective systems that are embedded in the needs of the growers and millers served by the research. Unfortunately, at this early stage of the Institute's development and limited availability of funds, the plan does not include much in terms of milling research. One needs to also recognize the need to mobilize human capacity to address various research issues that have been neglected over a long period of time. The Institute attempts to consult with a wide range of stakeholders to view issues through different lenses 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. All stakeholders in the industry are agreed on the need for forward thinking. SRIF supports this diversity, but the utility and impact of all our activities has been limited by our isolation from one another. To overcome this, the initiative taken by the government to set up "stakeholder meetings" and informal discussions with various stakeholders has assisted in establishing a forum that enables all involved in forward thinking to interact and share their views and findings. This will advance the foresight paradigm and provide opportunities for multiple interactions between stakeholders. The year, 2010 as a whole has been a difficult one for the industry. The continuing loss of important resources, due to natural events, had a major impact on cane production, particularly the drought for the first nine months of the year followed by a very wet period.

The plant breeding staff further enhanced their research capacity with the use of fertility tests which resulted in an increased number of seedlings for stage 1 planting. Pollen viability and preliminary results indicate that pollen is viable for approximately 5 hours before viability drops below 50 percent. Variety selection studies continued with the indication that a new variety may be ready for a large mill test next year. Some 436 varieties were replanted in the germplasm collection after reviewing their breeding

significance. Some 912 crosses were made of which 33 percent were experimental crosses, and some of them were Erianthus crosses. These seedlings will be DNA tested in Mauritius to check if they are hybrids of Erianthus. If they are, this will be an important step in the area of sugarcane breeding as only one or two countries have been successful in making Erianthus hybrids. Several steps are being taken to revamp variety selection as, for several years; this has not been undertaken with the importance that needs to be taken. The dry conditions during most of the year provided an opportunity to identify varieties that are tolerant to adverse conditions. In the process, three varieties have been selected for further evaluation.

The Institute has initiated work on sugarcane weevil borer and Fiji leaf gall disease projects with our collaborators, Bureau of Sugar Experiment Station, Australia. The institute has also been able to get a number of Fijian commercial varieties sent for smut resistance trials to be done by BSES. The laboratory received only a limited number of soil and leaf samples from the Extension Services for fertilizer recommendation. It is envisaged that the number of soil and leaf samples will increase as the service to the growers improves in years to come. The SRIF laboratory has been able to get certification under the ASPAC quality control assurance scheme for the analysis of the following tests: soil pH, electrical conductivity, extractable P, exchangeable Ca, exchangeable Mg, exchangeable K, exchangeable Na, organic matter and total nitrogen as well as % magnesium and % phosphorus for leaf analysis.

This year improvements were made in the communication system, and the SRIF website (www.srif.tk) was also established. The GIS activities continued with yield and Fiji disease data being mapped to identify patterns in cane production and disease spread. A mill audit was also undertaken by the Institute and the findings were provided to FSC and the government for their action. The funding from EU continued to support infrastructure and staff development. This provides the Institute an opportunity to venture out into areas of research and train staff which, under the normal situation, would not have been possible. This publication very briefly summarises the activities of research and development and SRIF hopes its wide circulation will generate awareness and draw attention to issues requiring appropriate action from stakeholders.

Jai S. Gawander


CROP IMPROVEMENT
Germplasm
Crossing
Selection program
Promising varieties
New released variety
Tissue Culture

Project 1 Germplasm

The existing germplasm dates back to the collections and hybrids produced in the 1960's and 1980's. The Germplasm is located in Drasa and at the Lautoka office with the total of 5986 varieties.

Table 1: SRIF Germplasm collection

Collection	Type	Count
Germplasm	Local/overseas cultivars, wild/ noble canes	4153
IJ/IK/IS	Erianthus pure and hybrids	1179
KT/BT	*S. officinarum x S. sponatneum* hybrids	330
JRP	*S. sponatneum* and *S. spontaneum* intra-specific hybrids	324
Total		5986

The germplasm at Drasa was verified in the field on a plot by plot assessment and the status of the varieties was confirmed. A final list of singles (X1), duplicates (X2), triplicates (X3), sixes (X6) and commercials (COM), Table 2, was prepared after taking away the dead plots and the varieties that had low breeding potential.

Table 2: Summary of germplasm

Bed	X1	X2	X3	X6	COM	Total
1	429	336	52	2	3	822
2	317	238	44	1		601
3	184	316	49	3	1	553
4	284	183	17		3	487
5	469	131	30		-	682
Total	1684	1202	192	6	7	3091
Clones	1684	601	64	1	7	2357

The duplicates and triplicates will be verified further using molecular markers i.e. DNA will be extracted and sent to Mauritius Sugar Industry Research Institute.

A total of 118 varieties from KT/BT and 167 varieties from the JRP collection was transferred from SRIF Lautoka and transplanted at the Wairuku Sub-station in Rakiraki on 29/11/2010. Another replicate of this will be planted in Lautoka in the 2011 planting season with the germplasm.

A total of 15 varieties have been imported from Bureau of Sugar Experiment Station in Australia to be introduced in the germplasm. The varieties are still under quarrantine observation and awaiting clearance from the Biosecurity Authority of Fiji. The varieties imported are Q23, Q151, Q155, Q171, Q183, Q200, Q203, Q208, Q219, Q220, Q230, Q234, Q237, KQ228 and KQ236.

Project 2 Flowering beds

The flowering beds are located at Dobuilevu in Ra province which favors natural synchronization of sugarcane flowering. There were a total of 8 flowering beds in 2010 with a total of 703 varieties. The flowering beds are summarised in table 3.

Table 3: Flowering Beds in 2010

Bed	Date Planted	# of varieties	Crop status	Total
1	02-Dec-09	34	1R	**703**
2	26-Nov-09	111	1R	
3	24-Nov-09	120	1R	
4	19-Jul-09	97	3R	
5	19-Jul-09	74	3R	
6	22-Sep-08	85	2R	
7	17-Aug-09	132	1R	
8	17-Aug-09	50	1R	

The % flowering in Beds 1-8 was 55% in 2010 compared to 71% in Beds 1-5 in 2009. The number of varieties flowered and % flowering by beds is given in table 4. The decrease in % flowering was due to non-flowering of noble canes in Beds 1-2.

Table 4: Flowering in different beds

Bed	Varieties	♀	♂	Both	Total	%
1	34	-	-	-	0	**0**
2	111	4	2	1	6	**5**
3	120	9	32	6	41	**34**
4	92	34	38	15	72	**78**
5	75	34	34	21	68	**91**
6	85	46	33	21	79	**93**
7	132	41	43	16	84	**64**
8	50	16	17	11	33	**66**
Total	**699**	**184**	**199**	**91**	**383**	**55**

Project 3 Crossing

The 2010 crossing was carried out between 06/05/2010 and 03/07/2010. The types of crosses that were set is summarised in the table 5.

Table 5: Summary of crosses in 2010

Type of Cross	# of crosses	% Total
Polycrosses	601	66
Bi-parental	7	1
Experimental	304	33
Total	912	100

There was an increase in experiemntal crosses that was due to flowering of *Erianthus spp.* and *S. robustum* in the IJ/IK/IS breeding plots.

This year pollen fetility tests were carried out to determine the sex of the sugarcane flower. Previously the sex was determined purely based on anther dehiscence i.e. more open anthers given by a flower meant the floweres were male. With the fertility test, the % staining of the pollen in the unopened florets would determine the sex i.e. flowers showing less than 10% stained pollen were taken as female, between 10-20 % as both male and female and more than 20% as male. The male flowers were harvested and placed in the crossing shed and pollen collection and viability tests were carried out every morning. The percentage of pollen tube growth indicated whether pollen is viable or not. However no compatability tests were done to confirm the penetration of the pollen tube on the stigma and style of the female flowers.

Overall, the pollen viability tests concluded that % viability varied between different polycrosses and varieties but the variation was not sufficient to establish any relationship between them. This was evident when a correlation was carried out and it was found that there was very little correlation between the % viabilities of different crosses and varieties meaning no strong relationship existed.

Plant Breeding Program
Project 4 Stage 1

Stage 1 is the seedling stage where the seedlings from various crosses sown are transplanted in the field and evaluated for sugar and physical appeal in comparison with standards. In 2010, LF2009 series was evaluated and planting of LF2010 series was in progress. The following is a brief account of each series.

LF2009 series

A total of 28952 seedlings were evaluated based on brix and physical assessment and 1881 clones (6.4%) were selected and advanced to Stage 2. The selection was carried out over 3 weeks from mid-September to early October. The clones selected include 82 *Erianthus* and 20 *S. robustum* hybrids of which 33 and 17 have been planted in the breeding plots respectively for use in the 2011 crossing season.

LF2010 series

A total of 33297 seedlings were raised for transplanting. The planting of the seedlings was delayed due to unfavorable field conditions and heavy

rains. The total number includes 6634 seedlings from experimental crosses with *Erianthus spp., S. robustum* and IJ/IK/IS varieties.
4000 seedlings from the total will be used for comparative study of family versus individual selection trial. The trial will be evaluated in 2011.

Project 5 Stage 2

This trial is the first clonal stage that follows selection from the seedlings stage. The evaluation is carried out using two methods i.e. preliminary selection based on field brix and physical attributes and secondly on biochemical analysis. In both cases the means of the standards are taken into consideration during selection. In 2010, LF2008 and LF2009 series were in stage 2 trial.

LF2008 series
A total of 925 varieties were brixed and 257 were preliminaraly selected for biochemical analysis with the standards. A final selection of 75 varieties (8%) was made based on biochemical data and advanced to Stage 3 trial.

LF2009 series
A total of 1881 clones have been planted and another 62 which had been selected from the experimental crosses have been transferred to the breeding plots in Dobuilevu. The trial has been planted in an Augmented Latin Square Design embedded in column x row design and will be analyzed in 2011.

Project 6 Stage 3

This is the second clonal stage after seedlings and is referred to as the observation plots. The selection is purely on biochemical evaluation together with notes taken during field visits and the selected clones are propagated for GxE trials at all mills. The clones are also sent for disease screening at this stage. LF2007 and LF2008 series were in Stage 3 trial in 2010

LF2007 series
A total of 75 out 76 varieties present in this trial were sampled while one variety LF07-115 was discarded in the field due to disease like symptoms i.e. excessive root primordia, clinging trash and stunted growth. Field notes were taken before sampling and were considered during selection.
A total of 20 varieties (26%) were selected of which 17 had higher %pocs than consolidated average of the standards (14.8%) and 3 that had %pocs lower than consolidated average of the standards but were selected based on field notes.
All the selected varieties have been planted for propagation at Rarawai for Stage 4 GxE trials planting in April-May 2011.

LF2008 series
There are 75 varieties in this trial which had been selected from LF2008 stage 2 and will be assessed based on the field notes and biochemical data in 2011. The trial has been planted in Rarawai.

Project 7 Backlog and Stage 4 & 5

The backlog trials refer to varieties from previous series that were re-selected based on biochemical data after the Stage 4 GxE trials but were not advanced to Stage 5. This was done in previous years therefore separate Stage 5 GxE trials were conducted for these varieties but no reliable data was achieved. It was decided to plant one GxE trial for all the Backlog series in 2011 and evaluate it from 2012-2014. The following table

summarizes the series that are in Backlog and Stage 5.

Table 6: Backlog and Stage 5 summary

Series	Status	# of varieites
LF1997*	Backlog	2
LF1998*	Backlog	3
LF1999	Backlog	2
LF2000	Backlog	3
LF2001*	Backlog	1
LF2002	Stage 5	7
LF2003	Stage 5	11

LF1997 and LF1998 series as well as LF2001 series (marked * in the Table no.1) will not be planted due to un-availability of seed cane whereas LF1999 and LF2000 series will be planted together with LF2007 Stage 4 and evaluated in 2012.

A separate GxE trial (Stage 5) for LF2002 series will be planted in 2011 and evaluated in 2012 and likewise for LF2003 series.

Project 8 Large Population Trial (Stage 4 LF2004 Series)

The first ratoon crop of the large population trial was evaluated in 2010. This trial has 16 test varieties and two standards (Ragnar and LF91-1925) planted in long rows.

Results and Discussion

The total rainfall received for the first ratoon crop from October 2009 to September 2010 was 776mm and the cane was under water stress for the duration of the trial. In spite of the drought conditions the growth of cane in this trial was good. The cane rows of each variety were divided into four sections (replicates) and small mill cane samples were harvested on 28th September 2010 from all the varieties.

The stalk height and weight were recorded for all the varieties and the cane samples were analysed to get some indication of the biochemical traits. This trial was harvested over a period of 3 days from 28-30 September 2010 and was 11.5 months old at the time of harvest.

The drought conditions that prevailed over the duration of this trial gave an opportunity to identify varieties that are tolerant to adverse conditions. The stalk height of 5 varieties LF04- 116, 448, 509, 512 and 532 was more than 2.4m and the elongation of these varieties under water stress conditions is an indication of its tolerance to drought. The cane yield of 7 varieties LF04-116, 173, 423, 448, 481, 509 and 918 was better than the standard variety Ragnar but LF04-423 is a very trashy variety. The varieties LF04-173 and 509 had 42 and 20% better cane yield than the standard variety Ragnar respectively. Ragnar was the better of the 2 standards. The sugar yield of 8 varieties LF04-173, 423, 448, 481, 509, 532, 619 and 918 was higher than Ragnar. Five test varieties LF04-512, 423, 173, 918 and 329 and the two standards were also analysed in the NIR at the mill lab. The NIR data gives a better indication of the sugar content and fibre percent of the varieties as compared to the small mill analysis. The fibre percent of the varieties tested in NIR were higher than the standards by at least 2 units (16%) and the sugar content of 3 varieties LF04-512, 173 and 329 were slightly higher than the standards. Based on the NIR data the sugar yield of 2 varieties LF04-173 and 918 were 44 and 16% better than the standard Ragnar and the sugar yield of LF04-423 was slightly higher than Ragnar. The variety selection committee has decided to propagate

LF04-173 for large mill trial and LF04-448, 509 and 918 for further evaluation in 2nd ratoon crop.

Table 7: Biochemical Results (1R)

Variety	brix	fibre	pocs	yield	
		%	%	tch	tsh
LF04-173	24.5	9.5	18.0	82.0	14.8
LF04-509	24.7	11.6	18.3	70.3	12.8
LF04-918	23.7	9.5	17.1	68.3	11.7
LF04-423	23.3	9.7	16.9	64.9	11.0
LF04-448	23.1	12.7	16.6	63.6	10.5
LF04-481	23.1	10.4	15.9	65.7	10.5
LF04-532	23.4	12.2	16.1	61.4	9.9
LF04-116	23.1	13.4	15.8	61.7	9.8
LF04-512	22.1	10.7	15.7	50.1	7.9
LF04-329	24.7	10.8	16.3	45.9	7.5
LF91-1925	22.8	9.2	16.5	44.3	7.3
Ragnar	23.3	9.6	15.8	57.9	9.1

Figure 1: Mechanical harvesting of large population trial at Legalega

Development of high fibre varieties

The high fibre variety LF02-541 was put through the large mill trial in 2010. This variety had low cane yield as compared to the standard and is not recommended for commercial release but will be put in the Germplasm collection.

Large Mill Trial The promising variety LF94-694, high fibre variety LF02-541 and standard Kiuva was put through the large mill trial at Rarawai to ascertain its quality in terms of sucrose content, milling capabilities and characteristics. The trial did not run smoothly because of the stop/start nature of operation encountered during the trial period.

The cane was planted in May 2009 and harvested in December 2010. The cane was 18.5 months old at the time of LMT analysis. This trial received 2124mm of rain for the duration of the trial. Pre-harvest samples from the LMT were analyzed at the institutes' small mill lab and on line samples were collected and analyzed at the sugar lab in Rarawai.

LF94-694 was also analysed at the Lautoka sugar lab (NIR). The cane for this analysis was harvested mechanically from Drasa estate and was 14.5 months old at the time of analysis. This site received 1470mm of rain for the duration of the trial. The results obtained from NIR analysis of LF94-694 were encouraging. The %ccs of LF94-694 was 3 units higher than the commercial varieties Mana and LF91-1925 at the time of harvest in July. The cane yield of LF94-694 was 88 and 79tc/ha at Rarawai and Drasa respectively.

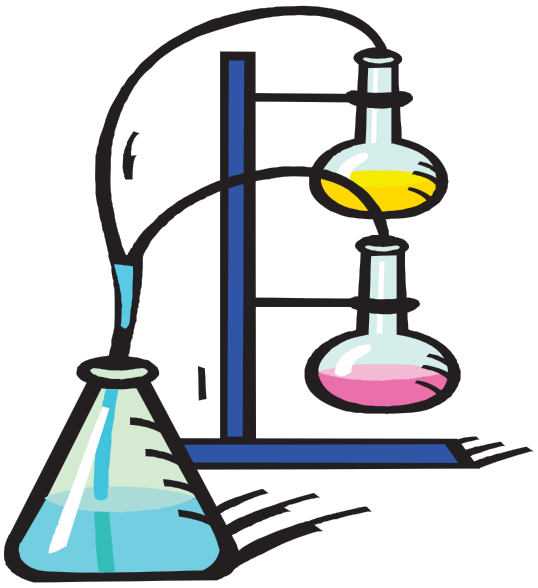
Table 8: LMT Analysis data

Cane variety	LF94 – 694	LF02 – 541	Kiuva
% Fibre	12.58	12.97	13.38
% Cell Breakage	91	93	91
POCS	9.72	8.95	10.44
Purity	80.7	78.4	82.6

Table 9: NIR data from Lautoka mill

Variety	% fibre	% ccs
LF94-694	11.6	13.0
Mana	11.6	10.0
LF91-1925	10.8	10.4

ANALYTICAL LABORATORY



- Soil & Leaf Samples
- Cane Samples
- Dextran Analysis
- Quality Assurance System
- Meteorology

Introduction

The analytical laboratory provides Fertilizer Advisory Services (FAS) to the growers and other research projects (such as breeding, agronomy and disease trials etc). The labaratory gives fertilizer recommendations to growers in the cane belt area on the basis of soil and leaf samples analysis.

Soil, leaf and cane analysis are the major activities carried out by the laboratory. Soil samples are analysed for soil pH, % organic matter, nitrogen, soil texture and major nutrients while leaf samples are analyzed for major nutrients such as calcium, magnesium, potassium, sodium, phosphorus and nitrogen. The blended fertilizer recommendations are made after the analysis of soil and leaf sample to determine the status of each nutrient in the sample. Cane samples are mainly analyzed to determine brix, pol, % pocs (pure obtainable cane sugar) and % fibre for research trials conducted by the respective sections in the four mill area.

The analytical laboratory conducts other projects such as nitrogen mineralization and phosphorus absorption index to develop simple models for fertilizer recommendation. The soil sampling for these projects has been carried out in 38 sectors in the cane belt areas in 6 different soil orders. The aim of the nitrogen mineralization project is to determine the nitrogen mineralization rating of the different soil orders in the sugarcane belt area. Manure nitrogen (N) comes in both organic and inorganic forms. Inorganic N, mostly ammonium (NH_4^+) and nitrate (NO_3^-), is readily available to plants. Before organic N can be taken up, however, it must first be converted to inorganic forms. This process, which is completed by soil microbes as a by-product of organic matter decomposition, is called mineralization.

Nitrogen has been widely studied as a plant nutrient and as an environmental pollutant. The amount of nitrogen that is mineralized in the soil is important for plant growth and therefore when determining proper nitrogen additions to the soil for optimum crop production. Being able to predict soil mineralization could also help to minimize nitrogen loss to the environment.

The phosphorus buffer index will help in recommendation of appropriate rates of blended fertilizer based on phosphorus adsorption values of different soil order in the cane belt. The phosphorus buffer index (PBI) is a measure of the availability of phosphorus (P) for plant uptake based on the soil type and its sorption class. PBI is a measure of a soils ability to 'hold onto' phosphorus. A high PBI soil will quickly bind up P and make it unavailable for plant uptake. The higher the PBI value and its sorption class, the more capacity the soil has to bind phosphorus, making it less available to the plant. Conversely a low PBI soil will have more phosphorus available to the plant. Fertiliser rates may need to be increased on soils with high PBI to compensate for the P that is unavailable.

The laboratory also carries out soil salinity and sodicity assessment on need basis or upon request by the Sugar Industry Tribunal to check whether a particular new farm is economically viable for sugar cane farming. Other analysis the laboratory conducts on request are cation exchange capacity, soil texture, organic matter and total nitrogen. The services

such as fertilizer recommendation, new farm assessment, analytical analysis is provided as a free service. The laboratory also provides attachment opportunities to graduate to get knowledge about research and laboratory activities carried out at the institute.

Soil and Leaf Samples

Soil samples collected for chemical analysis must be dried before carrying out analysis. Samples are grinded so that true representative sub-samples can be taken even when small amounts are used for analysis. The main purpose of the chemical analysis of the soil is to evaluate the available amount of nutrients that plant roots may take up under favorable conditions. Soil samples are analysed to determine the fertility status and appropriate blended fertilizer (A, B & C) is recommended. The number of soil and leaf samples received and analyzed for year 2010 is shown in the Table 1. A total of 903 soil and leaf samples were analyzed for different elements of which 221 soil samples were from growers fields. The assessment report for soil salinity and sodicity of 40 samples were discussed with the farmer. Grower meetings were conducted to educate growers on services provided by analytical laboratory and its benefits.

Table 1: Total number of Soil and Leaf Samples analyzed in 2010

District	Soil		Total
	Advisory	Research	
Lautoka	98	248	346
Rarawai	1	231	232
Labasa	122	100	222
Penang	-	52	52
Total	221	631	852
District	Leaf		Total
	Advisory	Research	
Lautoka	5	26	31
Rarawai	-	-	-
Labasa	-	-	-
Penang	-	20	20
Total	5	46	51
District	Grand Total – Soil & Leaf		
Lautoka	377		
Rarawai	232		
Labasa	222		
Penang	72		
Total	903		

[Table 1 Cont'd]

Cane samples

The management of the samples involves checking of proper labeling of cane bundles, taking weights of each bundle and the crushing process. This is most important step as any contamination of samples will affect the whole process of analyzing cane for % pocs, brix and % fibre. To determine percentage fibre in sugarcane the crushed cane is pressed using the compressor to remove all the juice .The fibre is then dried at 80^{o}C in oven for 3 days to remove all moisture. Brix is the water soluble solids in juice. This includes sucrose and other impurities such as salt, reducing sugars etc.The juice is extracted from the crushed cane and is filtered through nylon gauze wire. The brix of the filtered juice is determined with the refractometer. Extracted juice is also clarified using lead acetate powder (which coagulates colloids impurities and removes some colorant matter) and filtered. The pol of the clarified juice is read in a tube of standard length in a sugar polarimeter. A total of 1148 cane samples were analyzed for brix, pol, and fibre to determine %pocs in the small mill. The cane samples were from variety, agronomy trials and field audit conducted by SRIF. The number of cane samples analyzed in 2010 are presented in table 2.

Table 2: Cane Samples 2010.

	Trials		
	Agronomy	**Disease**	**Variety**
2nd quarter	62	*	162
3rd quarter	12	*	412
4th quarter	32	*	123
Field Audit	*	60	285
Total	106	60	982

The bio chemical data obtained from small mill cane analysis has been giving high % pocs values that were above 15 mostly and % fibre was quite low. The high values was suspected to be caused by the small mill cane samples that are stripped of all the leaves and there is no extraneous matter. The high values had been of concern and an experiment was conducted to determine the fibre and pocs values by adding 2.5%, 5%, 7.5%, 10%, 12% and 15% leaves in the fibre. It was found that the %fibre values increases as the % leaves added to the clean cane increased. The results obtained are presented in table 3.

Table 3: Results of % fibre

Treatment	Initial Weight	Dry weight + Bag(W1)	Bag Weight(W2)	%Fibre
Clean Cane	100	27.31	15.28	12.03
Clean Cane + 2.5% fibre	100(2.5g leaves)	28.87	15.80	13.07
Clean Cane + 5% fibre	100(5g leaves)	29.74	15.52	14.22
Clean Cane + 7.5% fibre	100(7.5g leaves)	29.95	14.97	14.98
Clean Cane + 10% fibre	100(10g leaves)	31.33	15.35	15.98
Clean Cane + 12.5% fibre	100(12.5g leaves)	33.39	16.00	17.39
Clean Cane + 15% fibre	100(15g leaves)	33.24	14.74	18.50

Nitrogen Mineralization and Phosphorus Adsorption Index

A project was undertaken by the laboratory to determine nitrogen mineralization capacity and phosphorus absorption index of different soil types such as (alfisol, Inceptisol, mollisol, oxisol, ultisol and vertisol) that are within the cane belt area so that possible amendments can be made to fertilizer advisory services provided by the laboratory in near future. A total of 422 samples have been analyzed for phosphorous buffer index (PBI) and the sorption values calculated. In the nitrogen mineralization project 493 soil samples have been analyzed for zero and seven day extraction. The data obtained is shown in Table 4 and further detailed analysis is required to make useful interpretation.

Table 4: Results of N-mineralisation and Phosphorus adsorption index.

Soil Order	Number of Samples	Mineralisable Nitrogen (mg/kg) Range	Phosphorus Buffer Index (PBI) Range
Alfisol	32	6.3 - 104.3	29-254
Inceptisol	94	2.1 - 92.4	17-254
Mollisol	50	3.5 - 97.3	19-254
Oxisol	5	2.1 - 27.3	55-254
Ultisol	13	14.0 - 63.7	31-108

Generally Inceptisol and Mollisol are found in the cane belt areas. Based on the data obtained, Alfisol and Inceptisol had the highest value of mineralisable N and Oxisol and Ultisol has the lowest value. The phosphorus buffer index (PBI) project will help in recommendation of appropriate rates of blended fertilizer based on

phosphorus adsorption values of different soil order in the cane belt. Generally most of the mollisol soils had low PBI and Oxisol and Ultisol had high PBI. The fertilizer rates have to be increased in soils with high PBI values and decreased in soils with low PBI values.

Quality Assurance System

Quality Assurance includes the policies, systems, programmes, procedures and instructions necessary to assure the quality of test results. All the laboratory's policies, procedures and practices have been documented. The procedures and policies described in this manual are mandatory for all staff to follow. Amendments to the procedures must be authorized by the Science Audit Committee before inclusion in the Quality Manual.

The Analytical Laboratory has an active internal analytical quality control program that covers all of the testing carried out in the laboratory and continues to have QC checks by having standard as well as quality control samples. Calibration of laboratory equipment and instruments are carried out as scheduled and recorded. Daily calibration checks of room temperature, pH of distilled water, quality of distilled water, balance and other instruments are also recorded. The laboratory also participated in external sample exchanges and proficiency programmes with members of SPACNET for accreditation of our laboratory to international standards. The capturing of data into computers from instruments like pH, EC meter, and polartronic is already in progress. This will reduce the error due to the manual transcription of data. Two ovens, digestion block, p H & EC meter, magnetic stirrer and refractometer were brought under EU funding. It is five years since the analytical laboratory joined the Australasian Soil and Plant Analysis Council exchange sample proficiency and has received certification in most of elements analyzed and assessed in the fourth year. For soil analysis, the laboratory has received certification for all the elements analysed whereas for leaf only magnesium and potassium are certified.

Dextran – Alcohol Haze Method

The chemical product that results from the degradation of sugarcane by micro-organisms activity is dextran. It is a good indicator of the deterioration of sugarcane quality during transit between fields and the factory. By reducing the lapse of time between cane harvesting and transport, the problem of degradation can be reduced substantially. Expensive enzymatic treatments are needed to remove dextran from mill juice when present in high levels.

An experiment was done during the field audit last year comparing burnt cane and green cane. The results obtained from the samples showed major variation in dextran levels. The dextran levels in burnt cane was almost double to that of green cane. This shows that burning causes the micro-organisms to hasten the degradation causing more damage to the plant. Samples of burnt cane were taken from cane lorries and rail trucks at random and analysed. The rail truck samples showed higher dextran concentrations. One of the reasons is that the rail truck samples are exposed to contamination, sunlight and humidity for a longer period of time. The lorry cane reaches the mill in a shorter period of time compared to rail cane.

Meteorology

Introduction

The Sugar Research Institute of Fiji has a wide range of meteorological instruments which are operational. There are forty-three rainfall stations in the cane growing areas that record and forward daily rainfall data. Climatological stations are manned by observers who are required to record basic observations such as temperatures (dry, wet, max, min, earth), rainfall, amount of clouds, visibility, sunshine, wind direction, wind force, evaporation at 9am and maximum temperatures at 3pm daily. At the end of each month the data are compiled and forwarded to Fiji Meteorological Station. The climatological data plays a vital role in predicting weather forecast, producing climate summary and quarterly climate outlook for sugarcane belt area.

Rainfall

The rainfall over the month of January to March 2010 period was generally below average across the sugar cane growing areas. The month of January was hotter and drier as El Niño phenomena continued from September 2009. The rainfall pattern for 2010 wetter months were quite different from previous years as November to April cyclone period was drier due to the El Nino effect. The south oscillation index returned to its neutral condition on April for the first time. Conditions were drier than normal across the sugarcane belts in the western division over April to June 2010 period. However, rainfall recording stations across the sugarcane belts in the northern division experienced average to above average rainfall in the same period. The trend of below average rainfall continued to be experienced across the cane growing areas in August. Rainfall in the western division was significantly below average at most of the rainfall stations during August 2010. The drought like condition prevailed from the month of October 2009 till September 2010. The observed rainfall in the four mill areas and at all the rainfall recording centres in the cane belt were above to well above average in October 2010. This rain was due to a trough of low pressure. The October weather was influenced by the convergence zone situated on the north of Fiji and moved over the group. Lautoka mill (206.2mm),Penang mill (248.8mm), Labasa mill(165.0mm) and Rarawai mill(141.4mm) recorded 202%, 230% , 143% , % and 137% above average rainfall respectively. The month of November was wetter than normal as the trough of low pressure was moving slowly over the Fiji group. The rainfall varied in December as Lautoka, Rarawai and Labasa mill area received above average rainfall and Penang mill received below average rainfall for December 2010. Overall in 2010, Labasa mill received the highest rainfall and Lautoka mill received the lowest rainfall (Table 1).

El Niño Southern Oscillation (ENSO)

El Niño Southern Oscillation **(ENSO)** 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***. The El Niño Southern Oscillation state became neutral in April. Most of the leading international climate models predicted that the tropical Pacific will be in a La Niña state before the end of August 2010. Despite 2009/10 El Niño event ending in June 2010, the effects became more marked

over the July to September period with many parts of the sugarcane growing areas experiencing extended dry spells. The El Niño Southern Oscillation (ENSO) indicators suggested typical conditions that favoured the developing stages of a La Niña. By mid July, the ENSO indicators reached levels that were typical of the early stages of a La Niña, and by late August the event was well established and continued to strengthen. The typical wet season rainfall pattern was experienced as early as October 2010 with a La Niña event. The above resulted in October and November experiencing significant amounts of rainfall across all mill areas. This resulted in October and November receiving above average to well above average rainfall. Wetter conditions continued in December.

Relative Humidity

Relative Humidity at 0900hrs were generally below average to average in Lautoka mill for January to October whereas generally above average for November and December.

Sunshine

Generally the sunshine hours varied from below average to above average at the Lautoka mill. From January to March the sunshine hours were above average and April to June the sunshine hours recorded were below average. Later in the months of July to September again the sunshine hours recorded was above average and below average for the month of October to December 2010.

Earth Temperature

The earth temperatures at all depths (5cm, 10cm & 20cm) were mostly greater than or equal to the long term mean values throughout the year except November and December. The temperature varied on day to day basis but there was an overall increase by 0.1 - 2.8ºC at different depth for respective month. The temperature decreased by -1.0 to -2.0 for the months of November and December 2010.In the month of April the earth temperatures at all depths were equal to or just below average.

Soil Moisture

January was very dry with little moisture and limiting growth of sugarcane. From February to March, the soil moisture was dry-limiting growth of cane. In the months of April, October, November and December the moisture status was moderate with sufficient moisture for growth. The rest of the months, the soil moisture status was dry-limiting while drought like conditions prevailed.

Air Temperature

Air temperatures, both daytime and night-time were above average for Lautoka mill during January to December 2010. The highest maximum temperature recorded was 36.1°C for the month of March and the lowest minimum recorded was 16.7°C for July 2010.

Evaporation

The sunken pan evaporation readings were above average from January to September and below average from October till December 2010. Similar pattern was observed for raised pan evaporation throughout the year with little variation. For the months of March and April the raised pan evaporation data was not correct due to the maintenance of the raised pan.

Table 1: Rainfall (mm) for all mills – 2010

Mills	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Lautoka Mill													
Monthly Rainfall	94.8	93.2	137.5	144.0	23.6	3.4	54.6	6.8	10.4	206.2	299.3	225.6	1299.4
No. of rain days	11	12	12	13	6	1	2	3	5	17	18	21	121
*40yrs Avg (1971-2010)	367.1	303.6	305.0	187.2	83.8	68.9	54.6	71.7	75.2	102.2	137.2	187.5	1944.1
% of average	25.8	30.7	45.1	76.9	28.2	4.9	99.9	9.5	13.8	201.7	218.2	120.3	66.8
Rarawai Mill													
Monthly Rainfall	122.5	141.4	166.2	166.7	57.0	0.8	53.0	23.5	31.6	141.4	484.7	266.6	1655.4
No. of rain days	13	8	15	15	6	2	3	4	5	17	23	23	134
*40yrs Avg (1971-2010)	373.6	345.7	370.5	203.9	93.0	80.0	43.5	67.1	76.6	103.5	154.8	238.2	2150.4
% of average	32.8	40.9	44.9	81.7	61.3	1.0	121.8	35.0	41.3	136.6	313.1	111.9	77.0
Penang Mill													
Monthly Rainfall	59.3	306.8	83.9	153.7	61.8	39.6	22.7	13.9	57.4	248.8	430.2	165.0	1643.1
No. of rain days	11	18	17	15	11	11	6	6	9	14	20	24	162
*40yrs Avg (1971-2010)	417.0	334.3	377.0	252.5	151.1	97.8	53.9	71.3	89.7	108.2	154.3	253.4	2360.4
% of average	14.2	91.8	22.3	60.9	40.9	40.5	42.1	19.5	64.0	230.0	278.7	65.1	69.6
Labasa Mill													
Monthly Rainfall	213.1	73.3	314.4	325.2	108.0	104.0	88.1	41.9	16.8	165.2	425.1	400.5	2275.6
No. of rain days	12	11	17	13	12	6	3	5	6	18	20	23	146
*40yrs Avg (1971-2010)	402.0	349.7	359.9	249.3	110.7	78.1	53.7	48.7	76.0	115.6	184.5	261.5	2289.7
% of average	53.0	21.0	87.3	130.5	97.6	133.2	164.0	86.1	22.1	143.0	230.5	153.1	99.4

Table 2: Rainfall data (mm) for Lautoka, Nadi and Sigatoka Districts 2010

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Drasa	162.7	14.2	182.8	107.1	15.0	0.0	61.0	30.3	58.0	188.8	281.3	200.2	1301.4
No. of rain days	7	3	8	5	4	0	1	3	6	9	11	8	65
Lovu	99.0	15.0	137.0	203.0	22.0	1.0	47.0	0.0	0.0	0.0	0.0	0.0	524.0
No. of rain days	7	5	7	5	4	1	1	0	0	0	0	0	30
Saweni	98.0	12.8	91.0	64.0	27.0	1.0	59.0	7.0	0.0	180.7	294.0	120.0	954.5
No. of rain days	4	3	5	4	3	1	1	2	0	7	8	8	46
Natova	124.2	44.0	157.8	103.0	14.0	4.4	37.0	31.0	4.6	166.0	388.0	410.0	1484.0
No. of rain days	4	5	5	4	2	1	1	2	2	7	11	13	57
Legalega	81.0	77.0	207.0	192.5	50.0	0.0	38.0	12.5	3.0	73.5	206.5	101.0	1042.0
No. of rain days	4	6	8	7	3	0	1	2	1	7	11	7	57
Meigunyah	80.0	78.5	208.0	190.0	69.0	0.0	31.0	12.0	3.0	65.5	186.0	115.0	1038.0
No. of rain days	4	6	8	5	3	0	1	2	1	7	10	6	53
Qeleloa	10.1	0.0	0.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.1
No. of rain days	1	0	0	1	0	0	0	0	0	0	0	0	2
Navo Dist/Office	69.4	47.9	324.9	235.3	35.5	2.4	52.9	29.3	11.7	67.2	499.1	267.0	1643
No. of rain days	3	8	13	7	3	1	2	2	1	5	9	12	66
Malolo	107.4	48.1	278.5	234.3	33.1	2.8	46.3	26.9	10.8	192.4	483.5	296.1	1760.2
No. of rain days	3	8	10	7	3	1	2	2	1	9	9	12	67
Nawaicoba	29.6	102.3	256.4	197.0	26.2	0.0	143.8	26.0	1.0	134.2	336.3	265.0	1517.8
No. of rain days	2	4	8	7	2	0	1	2	1	6	9	11	53
Yako	31.6	49.0	131.0	136.2	2.1	0.0	63.0	24.2	1.2	67.2	193.0	229.0	927.5
No. of rain days	2	3	6	4	1	0	1	2	1	9	8	10	47
Lomawai	17.5	199.6	182.4	177.0	51.9	0.0	104.5	0.0	0.0	100.2	161.5	198.6	1193.2
No. of rain days	3	6	6	5	4	0	2	0	0	6	9	8	49
Cuvu	39.5	96.5	189.5	185.5	36.5	8.5	106.5	10.0	2.8	75.5	151.5	48.3	950.6
No. of rain days	4	5	9	7	6	2	3	4	1	8	8	7	64
Olosara	59.0	78.0	102.0	159.0	28.0	10.0	102.0	12.0	0.0	68.0	196.5	81.0	895.5
No. of rain days	3	5	8	7	4	2	2	5	0	7	9	7	59

Table 3: Rainfall data (mm) for Rarawai Mill 2010

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Varoko (Sarava)	52.0	57.0	191.0	135.0	55.0	4.0	46.0	3.0	13.0	89.0	506.0	141.0	1292.0
No. of rain days	4	5	11	7	3	1	1	1	3	6	13	8	63
Mota	114.0	52.0	196.0	158.5	26.0	Nil	53.0	28.0	34.0	157.0	596.0	208.0	1622.5
No. of rain days	9	5	11	8	2	0	1	2	5	7	12	8	70
Naloto (Nukuloa)	161.0	174.0	308.0	260.0	45.0	Nil	45.0	17.0	46.0	139.0	660.0	205.0	2060.0
No. of rain days	10	5	11	8	2	0	1	2	5	8	12	7	71
Rarawai	102.2	59.8	144.4	171.3	57.0	3.2	45.7	11.0	32.4	143.9	449.9	233.7	1454.5
No. of rain days	7	5	11	7	4	1	1	2	4	10	13	9	74
AES - Rarawai	122.5	141.4	166.2	166.7	57.0	0.8	53.0	23.5	31.6	141.4	484.7	266.6	1655.4
No. of rain days	13	8	15	15	6	2	3	4	5	17	23	23	134
Koronubu	121.0	51.0	126.0	185.0	53.0	Nil	50.0	14.0	24.0	125.0	543.0	165.0	1457.0
No. of rain days	9	3	11	9	3	0	1	2	3	8	14	11	74
Veisaru (Navatu)	38.0	19.0	114.0	75.0	17.0	1.0	32.0	3.0	48.5	82.0	396.0	117.0	942.5
No. of rain days	3	4	11	8	3	1	1	2	3	9	13	8	66
Varavu	22.0	47.0	77.0	61.0	24.0	1.0	30.0	5.0	3.0	145.0	247.0	96.0	758.0
No. of rain days	2	4	11	6	2	1	1	2	1	8	12	6	56
Tagi Tagi	20.0	10.5	152.0	167.0	41.0	6.0	63.0	10.0	24.0	140.0	441.0	144.0	1218.5
No. of rain days	3	3	11	7	3	1	1	1	1	5	11	7	54
Yaladro (Tavua)	40.0	9.0	149.0	208.0	36.0	5.0	30.0	19.0	25.0	181.0	523.0	74.0	1299.0
No. of rain days	4	3	11	7	3	1	1	1	2	7	12	7	59
Drumasi	37.0	33.0	126.0	163.0	48.0	6.0	43.0	8.0	86.0	184.0	593.0	150.0	1477.0
No. of rain days	4	2	11	7	3	1	1	1	2	9	13	7	61

Table 4: Rainfall data (mm) for Penang Mill – 2010

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Nanuku	59.6	126.6	34.8	80.6	39.6	Nil	45.2	Nil	46.0	172.7	369.4	69.4	1043.9
No. of rain days	4	5	5	6	3	0	1	0	5	8	17	4	58
Malau	59.3	306.8	83.9	153.7	61.8	39.6	22.7	13.9	57.4	248.8	430.2	165.0	1643.1
No. of rain days	11	18	17	15	11	11	6	6	9	14	20	24	162
Ellington I	41.1	91.3	169.2	127.6	33.7	15.4	8.4	3.6	52.4	124.8	251.5	53.4	972.4
No. of rain days	12	18	24	17	10	12	4	4	7	14	17	16	155
Ellington II	72.9	171.3	400.3	536.7	57.6	41.8	114.2	20.7	79.2	371.6	890.4	221.7	2978.4
No. of rain days	6	10	7	19	9	10	3	5	7	15	19	12	122

Table 5: Rainfall data (mm) for Labasa Mill 2010

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Rokosalase (Solove)	148.5	77.7	413.0	248.0	53.8	106.9	64.2	15.5	79.0	298.2	552.6	333.5	2391
No. of rain days	7	9	10	17	4	3	2	1	1	12	18	12	96
Naravuka (Bulivou)	62.9	105.4	317.4	95.0	43.3	45.7	55.4	21.8	39.2	126.0	619.7	337.6	1869
No. of rain days	5	8	7	6	4	3	4	3	4	9	12	14	79
Natua (Seaqaqa)	145.9	66.8	121.3	264.4	39.6	79.0	16.0	15.6	3.7	230.8	287.2	160.2	1431
No. of rain days	13	9	15	18	4	5	1	3	2	20	14	13	117
Seaqaqa Sub. St.	332.0	94.0	466.5	324.6	35.6	90.4	60.8	28.4	38.0	322.2	359.2	286.3	2438
No. of rain days	9	7	15	10	3	1	1	6	6	14	14	14	100
Waiqele	218.8	114.2	252.2	328.5	121.3	100.5	79.3	48.4	33.5	204.7	546.1	417.5	2465
No. of rain days	13	9	12	9	9	4	1	5	8	17	16	15	118
Wailevu	183.6	86.0	332.5	351.0	115.1	92.3	83.0	21.4	10.0	187.3	355.4	317.3	2135
No. of rain days	9	9	14	10	8	6	1	3	4	13	13	13	103
Vunimoli	389.6	158.8	544.1	369.0	90.8	129.4	92.6	41.2	26.8	303.8	538.4	386.8	3071
No. of rain days	11	9	20	15	9	6	4	4	8	15	22	22	145
Korowiri	213.1	73.3	314.4	325.2	108.0	104.0	88.1	41.9	16.8	165.2	425.1	400.5	2276
No. of rain days	12	11	17	13	12	6	3	5	6	18	20	23	146
Nagigi (Bucaisau)	131.0	102.0	417.0	485.0	54.0	87.0	83.0	10.7	38.2	203.0	514.0	267.7	2393
No. of rain days	10	7	13	8	4	5	1	5	6	12	15	15	101
Daku	126.6	147.4	383.7	274.7	44.8	95.4	48.1	29.2	62.5	310.5	395.1	362.1	2280
No. of rain days	7	9	13	10	10	5	4	4	11	17	19	19	128
Kuru Kuru (Daku)	105.8	136.2	314.9	198.9	54.6	109.5	62.6	46.0	55.9	265.9	464.5	398.2	2213
No. of rain days	7	8	16	10	9	6	5	1	8	17	20	18	125
Wainikoro	204.6	234.0	386.0	157.2	73.0	91.0	49.0	14.0	67.0	303.0	433.0	451.0	2463
No. of rain days	8	9	14	8	8	4	3	3	5	14	16	15	107
Vunivutu (Wainikoro)	140.9	183.9	402.4	166.8	51.3	101.6	40.9	20.8	53.3	285.2	686.0	318.1	2451
No. of rain days	7	10	15	8	10	6	7	3	7	15	15	15	118
Papalagi (Wainikoro)	58.3	114.8	471.3	176.9	36.8	77.8	86.3	30.5	37.5	163.4	775.8	458.8	2488
No. of rain days	7	10	18	7	3	1	4	1	3	11	14	20	99

Table 6: Meteorological data for Sugar Research Institute of Fiji, Lautoka 2010

Measurements	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Relative Humidity	73	68	74	76	74	69	65	63	60	66	77	72
41yrs Avg (1970-2010)	75	77	77	75	74	74	71	70	69	69	70	71
Air temperature (°C)												
Mean maximum	31.9	32.8	31.8	31.0	31.0	31.4	29.4	30.5	31.7	30.6	29.4	30.6
Mean Max 41yrs Avg (1970-2010)	31.0	31.1	31.0	30.6	29.6	29.0	28.4	28.4	28.9	29.6	30.4	31.1
Mean minimum	24.3	24.1	24.1	23.4	22.8	22.5	19.9	20.4	21.6	22.8	22.8	22.8
Mean Min 41yrs Avg (1970-2010)	23.8	24.0	23.9	23.0	21.6	20.8	20.0	20.1	20.7	21.6	22.7	23.4
Mean	28.1	28.5	28.0	27.2	26.9	27.0	24.7	25.5	26.7	26.7	26.1	26.7
Highest maximum	34.3	35.8	36.1	32.4	34.0	34.0	31.8	32.2	33.7	32.7	32.1	32.4
Lowest minimum	22.0	22.4	21.9	21.2	21.1	19.7	16.7	17.8	18.9	21.1	20.2	21.1
Evaporation (mm)												
Sunken pan	192.4	150.9	161.3	100.5	108.8	97.7	119.2	140.0	155.4	154.3	124.3	114.6
Sunken Pan: 41yrs Avg (1970-2010)	162.5	122.2	133.3	125.8	108.2	94.8	116.4	136.0	142.6	175.8	161.2	187.8
Raised pan	323.9	182.0	0.0	32.8	114.7	106.3	144.2	148.7	177.6	164.5	168.9	173.3
Raised Pan: 41yrs Avg (1970-2010)	175.7	147.1	149.1	132.5	125.1	113.2	129.4	142.7	157.0	188.6	188.3	188.4
P:E ratio	0.29	0.51	0.00	4.39	0.21	0.03	0.38	0.05	0.06	1.25	1.77	1.30
Earth temperature (°C)												
5 cm	30.9	31.0	29.9	27.8	27.6	27.1	25.2	27.5	29.3	30.4	28.8	29.1
10 cm	30.3	30.6	29.8	27.8	27.5	27.4	25.6	27.4	29.4	29.6	28.0	28.6
20 cm	31.0	31.5	31.1	29.1	28.8	28.9	27.3	28.9	30.5	30.5	28.8	29.2
100 cm	23.8	24.6	24.7	23.4	23.0	22.8	21.6	22.3	23.8	24.1	22.9	22.6
41yrs Avg (1970-2010): 5cm	29.9	29.5	29.2	28.1	26.6	25.1	24.4	25.2	27.3	29.5	30.8	30.7
41yrs Avg (1970-2010): 10cm	29.2	28.9	28.6	27.8	26.4	25.1	24.5	25.2	26.6	28.2	29.4	29.6
41yrs Avg (1970-2010): 20cm	29.3	29.9	29.6	29.0	27.8	26.7	26.1	26.6	27.8	29.1	30.1	30.3
Sunshine (hours) -mean	8.8	7.9	6.3	5.9	6.3	6.4	8.1	9.4	8.6	6.3	4.5	6.0
41yrs Avg (1971-2010)	6.8	6.7	6.3	6.7	7.1	6.8	7.1	7.4	7.1	7.5	7.3	7.1

Table 7: Transeau Ratio (Precipitation/Evaporation) and Moisture Status of Soil 2010

P.E	Moisture status	Months
<0.25	Drought conditions	May, June, August, September
0.26-0.50	Very dry - limiting moisture. Slow growth.	January, July
0.51-1.00	Dry - limiting moisture. Slow growth.	February, March
1.10-2.00	Moderate - sufficient moisture for moderate growth.	April, October, November, December
>2.00	Good - sufficient moisture for good growth.	


CROP PROTECTION
Cane Weevil Borer
Nematology

CANE WEEVIL BORER

Split-cane trap

A two year project commenced during the year on Integrated Pest Management of the Sugarcane Weevil Borer (*Rhabdoscelus obscurus)* in Fiji. Six farms have been selected from Lautoka, Rarawai and Penang mill areas. From that 6 farms a paddock is selected which is about a hectare in size. 10 split-cane traps are placed in each paddock 10m into the row and 10 rows apart, 5 traps are placed in each end of the paddock. The traps are picked up every fortnightly and number of borers is recorded. The table below shows the number of cane weevil borers collected from the 18 farms and the number of male and female are recorded.

Table 1: Number of borers collected from Split traps

District	Number of borer (6 farms)		
	Male	Female	Total
Lautoka	1376	1310	2849
Rarawai	406	518	924
Penang	1200	1437	2637

By placing the CWB traps in a particular farm over a period of time it will be possible to monitor whether there is an increase or decrease in the number of male and female borers.

Pheromone trap

In the pheromone trap trials, 4 farms have been selected 5km away from split cane traps. The 10 pheromone traps are placed per farms 3m away from the edge of the paddock.

Table2: Number of borers collected from Pheromone

District	Number of borer (4 farms)		
	Male	Female	Total
Nadi	831	906	1757

The progressive results support the understanding that the pheromone normally attracts more female than male CWB. The trial is still in progress and the effect of other factors like temperature on the population is being studied.

Nematology

Although Nematodes was recorded in 1891 by N.A.Cobb on banana and in 1976 by Marshall Kirby on sugarcane in Fiji, since than no study has been conducted to see the effects of nematodes on sugarcane. A nematode survey of the cane lands was carried out in 2009-2010. A total of 384 soil samples were collected and analyzed. The soil samples were collected from ten different active cane growing farms in different sectors. There were 10 nematodes genera that were identified and counted in the soil samples. The most common plant parasitic nematodes found in Fiji's sugarcane fields are; Lesion, Reniform, Spiral, Ring, Dagger, Stubby, Stunt, Rootknot, Lance and Pin nematodes.

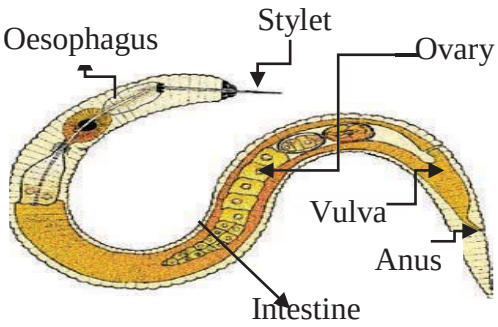


Figure1:Typical nematodes structure (Courtesy R. Esser)

The nematodes were extracted from the soil samples that were kept at 23°C and the different nematodes were counted. The soil texture o Intestine ples is clay loam and was friable on the tray when set up.

The plant parasitic nematodes are free living worm like organisms that can swim through the soil water and attack plant roots. Plant parasitic nematodes damage the plant cells using there stylet (needle like structure, see in figure 1) and suck out cell contents. They can destroy root tissues, cause malformations, and drain resources from the plant.

Lesion Nematodes – *Pratylenchus spp*
It is an endoparasite. They are widely spread in all the four mill areas. Labasa, Lautoka and Rarawai mill have very high population of lesion nematodes. They are mainly observed in clay loam soil and rarely found in silty loam and sandy loam.

Root-knot Nematodes – *Meloidogyne spp*
It is an endoparasite. Most sectors in Labasa mill area generally have very high population of root knot nematodes. Soils of Daku, Natua, Solove, Wailevu, Ellington, Malau, Nawaicoba and Yako are clay loam and these nematodes were widely spread in this soil type, clay loam soil and sandy clay loam. They are rarely observed in Loam and sandy loam soil.

Reniform Nematodes – *Rotylenchus spp*
An ectoparasitic nematode which are more common in Rarawai and Penang mills than in Lautoka and Labasa.

Ring Nematodes – *Criconamoides spp*
An ectoparasitic nematode commonly found in 4 mill areas. They are also found in Labasa sector in high numbers.

Stubby Nematodes – *Trichodorus spp*
An ectoparasitic nematode that are commonly observe in Labasa and Lautoka mill area but are present in small numbers in all mill areas.

Dagger Nematodes – *Xiphinema spp*
They are ectoparasitic nematodes found in small numbers in all the sectors.

Spiral Nematodes – *Helicotylenchus spp*
Ectoparasitic nematodes generally found in Labasa, Lautoka and Rarawai mill areas in high numbers. They are also found in all the samples that were observed.

Stunt Nematodes – *Tylenchorhynchus spp*
It is an ectoparasite. They are present in very small numbers in Lautoka and Rarawai mill areas and not observed in Labasa and Penang mill areas.

Pin Nematodes – *Paratylenchus spp*
They have been found in small numbers in Lautoka and Rarawai mill areas.

Lance Nematodes – *Hoplolaimus spp*
They are present in small numbers in some sectors.
The percent occurrences of nematode genera in 384 soil samples are presented in table 2.

Table 3: % Occurrence of nematodes

Nematode species	% occurrence
Pratylenchus	25
Helicotylenchus	28
Criconemoides	11
Meloidogyne	14
Rotylenchus	17
Tylenchorhynchus	0
Hoplolaimus	1
Paratylenchus	0
Trichodorus	2
Xiphinema	2

Pratylenchus and Helicotylenchus are most common and found in all sectors.

CROP PRODUCTION

- Seed Cane Nursery
- Early Weed Control
- Nitrogen Replacement
- Zonal Tillage
- Soil Compaction
- Intercropping
- Model Farm
- GIS
- Estates
- Rehabilitation of abandoned Farms
- FACP Tables
- Approved Varieties

Seed Cane Nursery Program (SCN)

There are lots of advantages of having a seed cane nursery. The farmers can get a better germination and improved cane yield by using seed cane from a healthy source such as a certified seed cane nursery. The ability to irrigate a nursery is highly desirable because a supply of water will assure that adequate amounts of seed cane will be available at the right time.

Heat treatment has become an important measure for ensuring healthy seed stock for control of diseases such as ratoon stunting disease and can be used in an integrated system of disease management. Heat treatments can also stimulate effects on germination, and when fungicides are used, it can reduce the infection of other fungal disease such as pineapple disease.

Table 1: Distribution of seed cane from the heat treated nurseries at different mill stations

Estate	Varieties distributed	Quantity tonnes
Waqadra	Kiuva	8.00
	LF91-1925	17.00
	Total	**25.00**
Rarawai	Mana	12.22
	Kaba	8.78
	Kiuva	13.08
	Total	**34.08**
Drasa	Kiuva	26.00
	LF91-1925	29.87
	Mana	13.50
	Total	**69.37**
Labasa	Kiuva	26.00
	LF91-1925	22.00
	Total	**48.00**
Total All Estates		**176.45**

Ratoon stunting disease is prevalent in Fiji and can cause losses up to 27% in cane yield annually. This major disease is cured by hot water treatment. Other minor diseases are also cured by heat treatment.

The nurseries provided seed cane that was free from disease and pest infestation, 8-10 months old with healthy buds and pure stand of the variety.

A program of seed cane production using hot water treated cane setts and well maintained with regards to nutrition, weed control, disease inspection and appropriate irrigation when needed would have resulted in good quality seed cane.

A total of 34.2ha were planted in the SRIF administered estates in 2010 on secondary and tertiary seed bed nurseries. This are classified as Distribution plots and a total of 176.45t were distributed to farmers from the SRIF administered estates and was 4% of the available seed for the 2010 planting season.

Seed cane of new varieties LF91-1925 and Kiuva was distributed to farmers free of charge. The reasons for the very low uptake of seed cane from the Estates were due to the EL NINO effects experienced in 2010 with a total rainfall of 1038mm but the water requirements for the sugar cane crop were not sufficient for proper growing except for Rarawai estate which used irrigation facilities.

The targeted planting for 2010 was 60ha and we have been able to achieve 69.5ha of which 51% was planted by farmers and the remainder planted on the estates.

Early weed control

The weed trial that was established on a humic latosol soil in Lautoka was harvested and analysed. From this trial it was found that the treatment combination of Velper K4 (4kg/ha) with Amine 720 mixture applied at 4 weeks after planting gave the highest yield compared to other treatments. This assessment indicates that weed control at an early stage ensures greater returns for the farmer.

The table below summarises the yield and estimated revenue gain by applying the weedicides at 4 weeks instead of 7, 10 or 13 months. The revenue gain is based on the current cane price of Fijian $45 per tonne of cane.

Table 1: cane yield from weed control trial

Treatment Velper K4 + Amine 720	Cane Yield (tc/ha)
T1 – no control	24
T2 – at 4 weeks	113
T3 – at 7 weeks	92
T4 – at 10 weeks	74
T5 – at 13 weeks	47

Table 2: yield and revenue gain

Weedicide application at 4 weeks instead of:	Yield increase (tc/ha)	Benefit ($) @ ($45/t)
7 weeks	21	945
10 weeks	39	1755
13 weeks	66	2970

Nitrogen Replacement Methods

Two nitrogen replacement trials were established in 2009 for the ratoon crop. Three treatments were applied that included a control (no fertilizer). Treatment 2 was based on leaf analysis recommendation from the laboratory treatment 3 was based on the amount of Nitrogen removed for every tonne harvested from previous season. The trials were harvested in 2010 and the data shows that there was no significant difference in the cane yield of the two major treatments applied.

Table 3: N Replacement Results

Treatment		Waqadra	Drasa
		Tcha	
1	control	26B	45B
2	104kg N/ha	50A	64A
3	81kg N/ha	55A	57A
		% pocs	
1	control	15B	17.3A
2	104kg N/ha	16A	17.4A
3	81kg N/ha	16A	17.6A
		Tsha	
1	control	4B	8B
2	104kg N/ha	8A	11A
3	81kg N/ha	9A	10A

Means in the same column followed by the same letter are not significantly different at P=<0.05 according to Least Significant Difference method (LSD)

Figure 1: Weedicide applied 4 weeks after planting

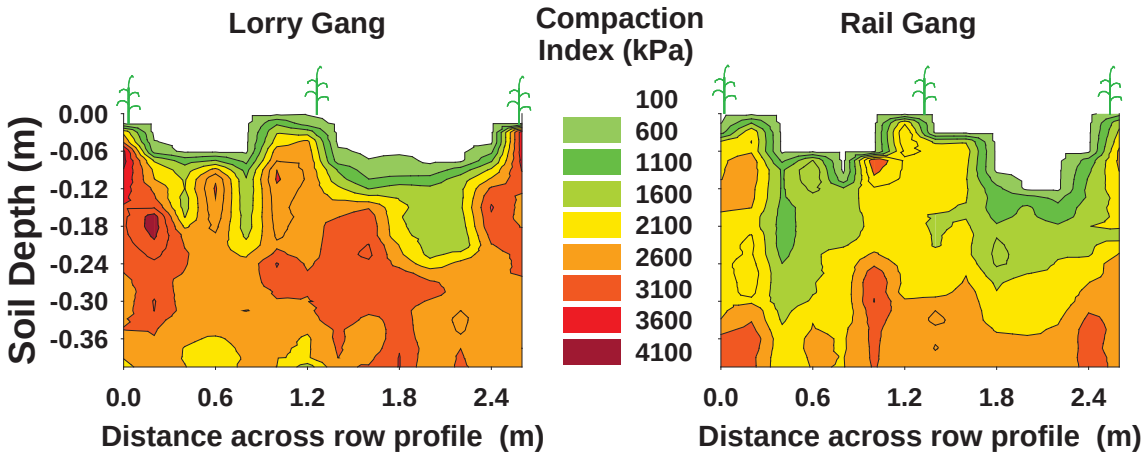
Figure 2: Weedicide applied 10 weeks after planting

Bio-compost Trial

Bio-compost fertilizers enrich our soil with nutrients required by cane to grow without causing any detrimental effect as caused by chemical fertilizers. A bio-compost trial was established in 2010 at Drasa. The trial was established to study the effects of bio-compost fertilizers and chemical fertilizers on cane. The growth assessment done at 3, 5 and 7 months show that there is no difference in tillers and stalk height of the treatments applied but the conclusion can only be made after the yield from the treatments is obtained.

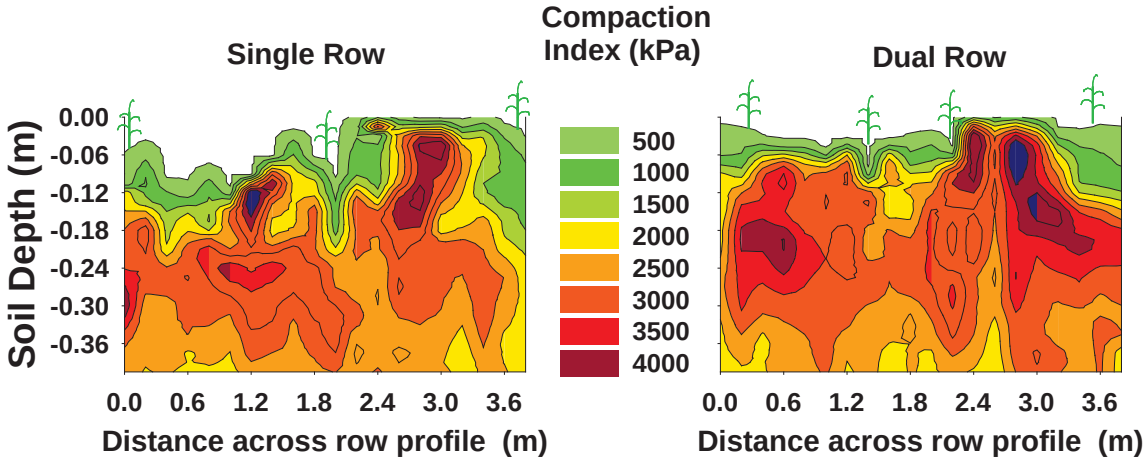
Soil compaction

Figure 1 Soil compaction comparison for rail and lorry transportation methods of cane manually harvested



A study was carried out to see the compaction between two major transporting systems of cane in Fiji. The graph shows that lorry transportation used gives more compaction compared to the rail. Compaction above 2068 kPa causes the cane roots to grow laterally, which leads to stool tipping and lodging of cane. Also when the cane root is not able to penetrate to its optimum level it hinders the yield. Mechanically harvested field: sub-soiler must be used.

Figure 2 Soil compaction for mechanically harvested fields



Intercropping

Crop production can be increased by maximizing the use of agricultural land through crop diversification. Another option is to convert additional land under cultivation by expanding into marginal lands which has become a practice in Fiji.

Hence, of the available options, increase in intensity of cultivation and in yields per unit area is the only available options to meet future market demands.

Crop diversification can be a useful means to increase crop output under different situations. The cultivation of field crops in sugar cane in Fiji has been defined as crop diversification or intercropping. The current practice in Fiji is planting subsistence crops to the main cropping system.

The objective of this trial was to investigate the efficacy of producing potato when intercropped with sugar cane in Fiji's sugar cane belt.

The opportunity to plant such a trial with sugar cane materialized with the support of the Ministry of Agriculture that supplied the seed material for Red rascal, a potato variety bred in New Zealand.

The five intercropping trials were planted in the Ba – Nadi area to observe the yield of potato. The potato was harvested between September and November 2010.

This project was conducted in conjunction with the Ministry of Agricultures' Legalega Research Station in Nadi. The amount of potato seed per farm was 200kg.

Fertilizer applied at the base was NPK (15:15:15) NPK and the yields obtained from the trials are summarised in table1.

Table 1: Potato intercrop yield

Sector	Area (Ha)	Harvest yield (kg/ha)
Koronubu	0.1	2470
Lautoka	0.1	**0
Natova	0.1	3520
Meigunyah	0.1	4580
Qeleloa	0.1	200

****Ploughed out due to poor germination**

Part of the Koronubu and Meigunyah trial were affected by bacterial wilt *Ralstonia (Pseudomonas) solanacearum*, but the Meigunyah trial gave a better yield due to its soil type (sandy).

The trial at Qeleloa had poor germination and was badly affected by the dry weather conditions. Potato is recommended for planting during the cooler months (May-July).

Overall, potato intercropped with sugar cane can be a very successful venture for sugar cane farmers as this can generate additional income and also provide a source of food.

Support from stakeholders such as FSC and Ministry of Agriculture through funds for seed and other costs will get farmers interested and involved with their crops including sugar cane

Figure 1: Potato planting

Geographic Information System

Fiji Leaf Gall Disease Mapping

The mapping of Fiji Leaf Gall (FLG) disease was completed during the year based on the rouging data from 2005 to 2009. The infected farms were identified by adding a field in the attribute table of the 2009 production data, which showed the occurrence of FLG disease over a five-year period. The infected farms were confirmed in 2010 by the rougers who plotted these infected farms by using the GPS.

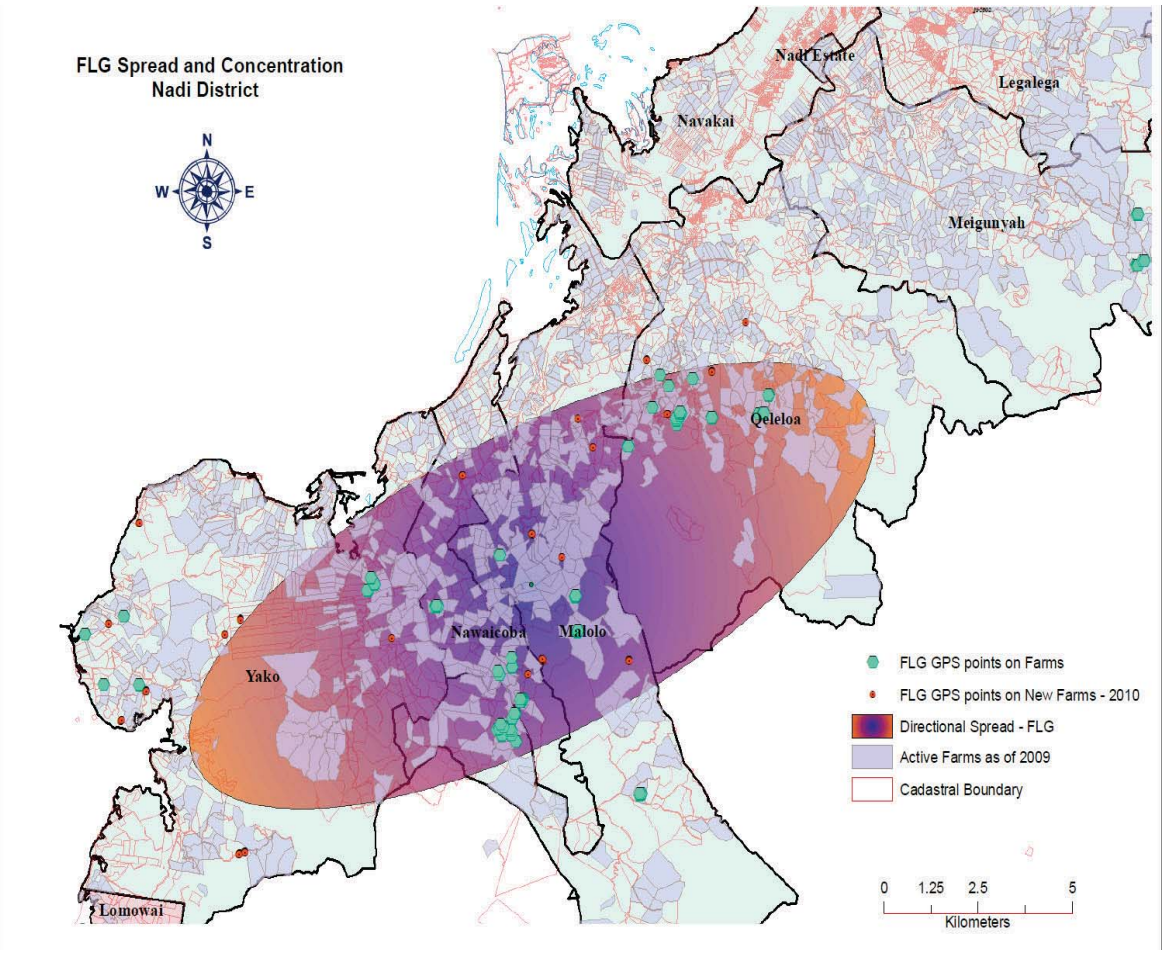


Figure 1: FLG spread & concentration – Nadi district.

The plotting allowed identification of farms that had a conflict in the boundary according to the GIS base map in the system. The unique points outside the farm boundaries marked by the GPS were identified as new FLG disease infected sites which became prevalent over the years as they were new sites comparing with the five year rouging data from 2005 to 2009.

Sector Production Mapping – Lovu

Fiji cane sector mapping was initiated with reference to the Drasa Pilot map as a guide. The production data as of 2009 provided by FSC was mapped. The allocation of production data to individual farm numbers enabled the mapping of production with respect to the spatial distribution.

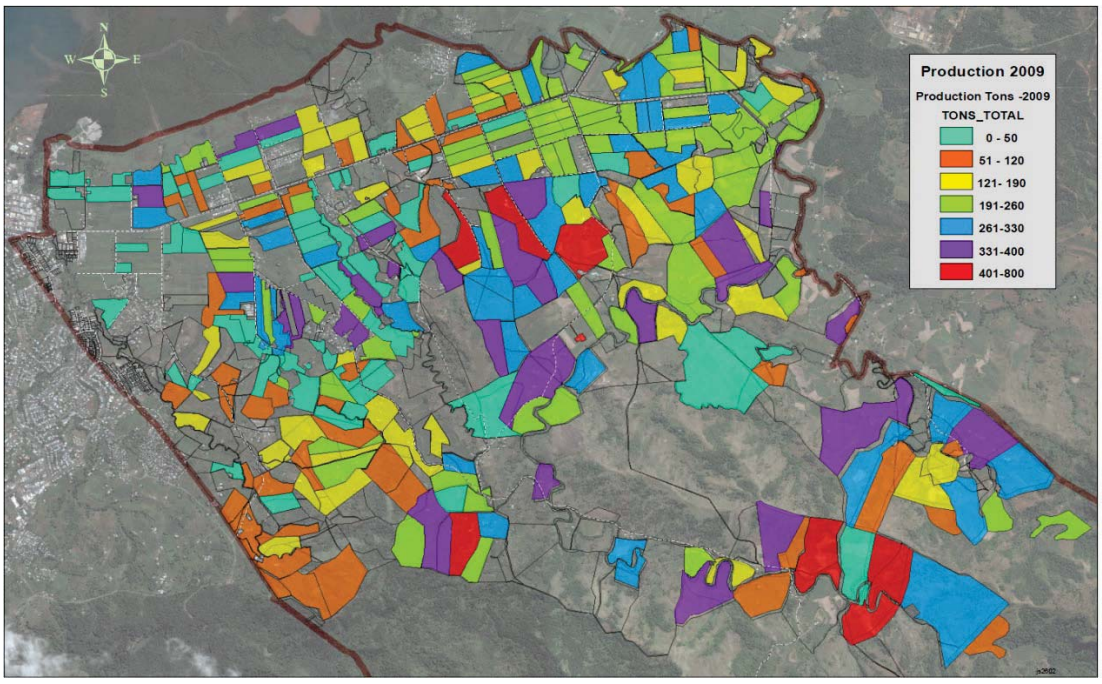


Figure 2. Lovu Sector Production 2009

Figure 3. Lovu Sector Farms – Active Vs Inactive

Estates

The five millers owned estates that were managed by the Institute produced a total of 16,086 tonnes of cane from 278.8 hectares and the combined average yield was 58tpha.

Table 1: All Estates production in 2010

Estate	Area under cane	Cane Produced	tpha
Drasa	108	5997	56
Waqadra	74	4265	58
Rarawai	63	3423	54
Labasa	30	2063	69
Penang	3.8	338	89
Total	**278.8**	**16086**	**58**

Drasa Estate

Drasa Estate has a total area of 127.5 hectares available for cane planting. In 2010, 91.4 ha was under commercial cane, 19.7 ha old other variety, 1 ha research trials, 13.4 ha short fallow and 1.5ha was long fallow. The total cane production at Drasa Estate in 2010 season was 5997 tonnes from an area of 108 hectares that gave a yield of 56 tonnes per hectare. There was a decrease of cane production from 67tpha in 2009 to 56tpha in 2010. In addition there was a decrease of 18% in burnt cane (1498tonnes in 2010) as compared to previous year (3262tonnes in 2009).

Table 2:: Drasa Estate Cane Production 2010

Crop	*Commercial*			*Research*		
	ha	**tonnes**	**tc/ha**	**ha**	**tonnes**	**tc/ha**
Plant	23.2	2013	87	0.8	60	75
1R	5.8	317	55	-	-	-
2R	3.4	95	28	-	-	-
OR	54.9	2442	44	0.2	14	70
Total	**87.3**	**4867**	**56**	**1.0**	**74**	**74**
Crop	*Old Other Variety*			**Total**		
	ha	**tonnes**	**tc/ha**	**ha**	**tonnes**	**tc/ha**
Plant	5.3	413	78	29.3	2486	85
1R	3.1	212	68	8.9	529	59
2R	0.3	21	70	3.7	116	31
OR	11.0	410	37	66.1	2866	43
Total	**19.7**	**1056**	**54**	**108**	**5997**	**56**

The major weather event of the year was the El Nino effect which started in January and continued till September. This resulted in below average rainfall especially during the first quarter of the year which happens to be the growing period for cane.

During 2010 season a total of 1727mm of rainfall was received and this was 1378mm less compared with 2009 season. Because of drought conditions the crop did not grow to full height with thin stunted stalks compared to normal season. The cane production per hectare decreased by 11tc/ha compared to 2009 season.

All fertilization was done mechanically except the trials. A total of 1619 bags of fertilizer was applied that included 21 bags blend A, 226 bags blend B and 1372 bags blend C. In nutritional value the 2010 crop received 231kgN/ha, 46kgP/ha and 172kgK/ha.

The 2010 harvesting season commenced on 24/06/10 and ceased on 03/12/10 whereas estate harvesting commenced on 20/07/10 and ceased on 07/11/10. Apart from research cane (73t) which was harvested manually the remaining cane (5924t) was harvested mechanically. All cultivation, fertilization and harvesting was given out on contract.

Total cane planted in 2010 was 19.3 hectares out of this 2.0ha was Kaba, 7.4ha Kiuva, 2.4 ha Naidiri, 3.5 ha LF94-694 (near commercial) and 4.0 ha research trials.

Approximately 262 tonnes of cane was used as seed material, out of this 135t was used for estate planting, 25t LF91-1925 and 23t Kiuva were given free to farmers as part of promotion of the

newly released varieties, 11t was sold for cash and 68t was sold on FSC order.

Table 3 Drasa Estate production figures (2006-2010)

Year	Area ha	Tonnes					Yield tpha
		Burnt	%	Green	%	Total	
2006	113.5	5523	67	2701	33	8224	72.5
2007	104.8	2819	38	4523	62	7343	70.1
2008	114.8	2864	40	4254	60	7118	62.0
2009	94.2	3262	46	3082	54	6344	67.0
2010	108	1498	25	4499	75	5997	56.0

Waqadra Estate

Nadi Estate has a registered area of 85.0 ha of which 20.1 ha is unaccounted for. The total area available for cane production is 64.9 ha with farm basic allotment of 3856 tonnes.

The Estate has two contracts as Farm # 12902, and Farm # 12055. This report provides an overview of the activities, operations and the production details of Nadi Estate in the 2010 season.

The total production of cane at the Estate this year was 3423 tonne of cane from 63.0 hectare giving a yield of 54.3 tpha. The remaining 1.9 ha was set aside as long fallow in 2009 and has been planted with variety trials this year.

An additional 32 tonnes were given as seed cane to 16 growers, 110 tonnes were used for planting at Waqadra & Drasa estate and 20 tonnes stand over due to FEA main power cable over the field. The commercial cane production was 2654 tonnes from 52.3 ha (50.7 tpha) and production from research trials was 769 tonnes from 10.7 ha (71.8 tpha). Commercial cane occupied 83.0 % of the AUC whereas research cane occupied 17.0 %.

There was a significant decline in cane yield from 87.3 tpha in 2009 to 54.3 tpha in 2010. The timing and implementation of activities like planting, fertilization and weed control is very important and any adverse weather conditions during such practises have detrimental effect on the yield.

The decrease in was mainly due to the prolonged drought in the season and late harvesting of cane in 2009 did not have ample time for crop growth. Rainfall from January 2010 to April 2010 was 556.5mm (41.4%) whereas the annual rainfall was 1343.5 for 2010 season.

Table 1: Waqadra Estate Cane Production 2010

Crop	Research			Commercial			Total		
	ha	tons	tpha	ha	tons	tpha	ha	tons	tpha
Plant	5.5	468	85.1	10.1	765	75.7	15.6	1233	79.0
1R				4.3	333	77.4	4.3	333	77.4
2R	3.6	198	55.0	6.4	322	50.3	10.0	520	52.0
OR	1.6	103	64.3	31.5	1234	39.2	33.1	1337	40.4
Total	10.7	769	71.8	52.3	2654	50.7	63.0	3423	54.3

Table 2: Waqadra Estate production figures for the last five years (2006-2010)

Year	Area ha	Tonnes					Yield Tpha
		Burnt	%	Green	%	Total	
2006	61.3	4242	73.8	1502	26.2	5744	93.7
2007	56.6	2971	71.6	1176	28.4	4147	73.3
2008	59.6	2971	69.8	1176	30.2	4252	69.6
2009	48.6	2190	53.5	1899	46.5	4089	84.1
2010	63.0	1349	39.4	2074	60.6	3423	54.3

Rarawai Estate

The Rarawai Estate produced 4265 tonnes of cane with average yield of 58t/ha. Approximately 310 t was used as seed material for 2010 planting at Estate and rehabilitation of abundant farms. There was overall decrease of cane production from 62tpha in 2009 to 58 tpha in 2010.

Table 1: Rarawai Estate Cane Production 2010

Crop	Research			Commercial			Total		
	ha	tons	tpha	ha	tons	tpha	ha	tons	tpha
Plant	3.2	220	69	12.4	1028	83	15.6	1248	80
1R	2.6	110	46	10.3	660	64	12.9	770	60
2R	4.0	138	37	7.5	462	62	11.5	600	52
OR	1.7	35	21	32.3	1360	42	34.0	1395	48
Total	11.5	503	44	62.5	3762	60	74.0	4265	58

The El Nino effect from January to September 2010 resulted in below average rainfall received in the the active growing period of cane. A total of 1655 mm rainfall was received during 2010 season compared to 1823 mm in 2009.Late harvesting in 2009 has also contributed to low yield in 2010. The cultivation, fertilization and weed control was greatly affected by delay in harvesting. Most of this work was given out on contractual basis. The 2010 Estate harvesting commenced on 29th June 2010 and ended on 7th January 2011. The contractor harvested 534t (13%) and the remaining crop including the trial cane was harvested by estate casuals and outside gangs. Of 4265 t harvested and sent to mill, 2555t was green and 1710 t burnt cane. Total cane planted in 2010 season was 17.1 hectares out of this 2.3 ha was Mana , 1.8ha Kiuva ,9.0 ha Kaba and 4.0 ha research trials. Apart from Estate planting, 30t seed cane was sold to growers and approximately 15 tonnes of Kiuva seed cane was given for free to growers under new variety propagation.

Table 2: Rarawai Estate production figures for the last five years 2006-2010

Year	Area	Tonnes					Yield
	ha	Burnt	%	Green	%	Total	tpha
2006	83.2	6033	74.7	2041	25.3	8074	97
2007	79.5	2797	55.0	2292	45.0	5089	64
2008	74.6	2206	50.1	2194	49.9	4400	59
2009	76.6	1583	33.3	3167	66.7	4750	62
2010	74.0	1710	40.0	2555	60.0	4265	58

Labasa Estate

Labasa estate has a total area of 38.0 hactre available for cane planting .Total cane harvested this season was 2063 tonnes from an area of 30.0 ha giving an yield of 68.8 tpha. Two hundred tonnes of cane has been left as stand over due to poor mill performance and bad weather in the later part of the season.

There was an increase in cane production due to good favourable weather condition, timely cultivation, early fertilization and early harvest of previous year's crop. Approximately 100 tonnes of the new varieties Kiuva and LF91-1925 were given to Labasa growers. The newly purchased farm at Batnikama produced 207 tonnes of cane from 3.6ha giving an yield of 57.5 tpha.

Table 1: Labasa Estate Cane Production 2010

	Area	Tonnes					Yield
	ha	Burnt	%	Green	%	Total	Tpha
Estate	30	126	6	1937	94	2063	68.7
Bat	3.6	20	9.5	187	90.5	207	57.5

Labasa mill received 2275.6 mm of rainfall this year. Cultivation in the estate and the Batnikama farm was mostly done mechanically. Minimum cultivation was practiced this year and 82% of the beds were kept under trash to reduce the cost of production. The amount of nutrient applied to the cane in 2010 was 130 kg of N, 20 kg of P and 92 kg of K. The estate was well maintained with field drains dug and cleaned to reduce water logging.

Table 2: Labasa Estate production figures for the last five years (2006-2010)

Year	Area	Tonnes					Yield
	ha	Burnt	%	Green	%	Total	tpha
2006	30.0	367	18.7	1566	81	1913	63.8
2007	28.4	324	17	1569	83	1892	66.4
2008	24.6	778	63	454	37	1232	50.1
2009	26.6	NIL	NIL	1623	100	1623	57.7
2010	28.0	126	6	1934	94	2062	68.8

Penang Estate

Penang estate has an area of 4.1hectares that is divided into four blocks that are planted with commercial varieties. In 2010, 338 tonnes of cane was harvested from an area of 3.78ha and sent to the mill. Spot weeding and spraying the inter rows and road around the estate was done on time and fertilization was delayed because of late delivery of the fertilizers.

Table 1: Penang Estate production figures for the last five years (2006-2010)

Year	Area ha	Burnt		Green		Total	Yield Tpha
		Tons	%	Tons	%	Tons	
2006		30	7.8	353	92.2	383	95
2007	4.01	20	8.0	237	92.0	257	67
2008	4.01			337	100	337	84
2009	3.69			309	100	309	84
2010	3.78	62	18	276	82	338	89

Rehabilitation of abandoned farms

Out of the 4 farms planted under the RAF scheme, 3 were harvested in 2010 and one farm that was planted late in 2009 was not harvested.

The production details are shown in table 1. In spite of the adverse weather (drought conditions) the yields were high. Difficulties were encountered in harvesting all the cane because of the bad weather conditions towards the later half of the harvesting season.

Table 1: Production details RAF Farms

Farm No.	Harvesting details		
	Ha	Tonnes	tcha
47	2.2	170	77.3
69	4.6	475	103.3
18565	0.8*	50	62.5
18575	Will harvest in 2010		
Total	7.6	695	91.4

*4.4 ha standover.

The production results obtained has prompted a rejuvenated interest in cane farming amongst farmers in the surrounding areas and from farmers aware of this project. Many farmers have applied for this assistance, but due to financial constraints SRIF cannot assist.

The existing farms should be maintained for demonstration and as a module of the feasibility of this project should funds be made available in future Records and data of activities and results to be evaluated for future use in the pursuit of increasing sugar production in Fiji as this project deals with nil sugarcane production land that was producing sugarcane before.

Most of these farms are in debt to Banks and other lending organizations, but through the confidence vested in SRIF by these organizations, these farms have been rehabilitated and the farmers are able to meet their commitments and increase sugarcane production.

The Project results have demonstrated the feasibility of this project and with more evaluation of the activities results a more comprehensive and sustainable development module can be drawn up to increase sugar production using abandoned, nil production and low production cane farms.

The assistance of other Sugar Industry stakeholders and funding is necessary to develop and sustain this project successfully. The onus is on farmers to take responsibility and ownership of the industry to ensure its survival and this project is a step in the right direction. The second Rehabilitation Project comprising four (4) farms in Koronubu were planted in 2010 and will be harvested in 2011. The plant crop is well established on 14.6ha and estimated production is 1300 tonnes with a yield expected to be above 90t/ha. Indolent

FACP Tables

Appendix 1: Main features of 2010 season compared with 2009

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Total registrations	5678	5612	5261	5233	4057	4047	1891	1876	16887	16768
Total farm basic allotments (tonnes)	979058	930419	797382	907150	910744	863638	301164	30117	2988348	3002381
Total registered area (hectares)	24534	25155.2	22266.8	22139	19079	18979	8924	8897	73804	75170
Total area cultivated (hectares)	15914	1522	17959	15040	16989	15922	4410	5709	55273	51900
Total area harvested (hectares)	14461	13780	15140	13519	15140	13974	4262	3654	49003	44927
Total farm harvest quotas (tonnes)	Open		Open		Open		56700		Open	
Sugar make actual(tonnes)	50114	44647	40382	30710	55666	39782	21449	17995	167610.3	133134
Tonnes 94 N.T sugar	53313	43384	42222	31580	57548	40943	22126	18530	175900.7	134436.4
Yield tonnes 94 N.T.sugar per hectare	3.69	3.15	2.79	2.34	3.80	2.93	5.19	5.07	3.59	2.99
Tonnes cane per tonnes sugar 94 N.T.	13.95	12.57	14.31	15.18	11.81	13.55	9.91	10.8	12.77	13.24
%POCS	10.2	10.1	10.19	9.60	10.8	10	10.6	10.6	10.19	10.88
Cane purity average for season	79.4	81	79.4	76.2	79.8	80	80.0	80.5	79.4	81.0
Tonnes cane harvested	726046	527663	659351	522114	679584	554575	181650	17570	2246631	1780053
Tonnes cane crushed	726046	545431	659351	479294	679597	554575	181193	20074	2246371	1780047

Appendix 2: Monthly rainfall(mm) for 2010 compared with long term average

Mills	No. of years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lautoka	2010 actual	94.8	93.2	137.5	144	23.6	3.4	54.6	6.8	10.4	206.2	299.3	225.6	1299.4
	102 yrs avg. to 2010	303	318	315	182	97	64	50	68	72	91	126	190	1818
Rarawai	2010 actual	122.5	141.4	166.2	166.7	57	0.8	53	23.5	31.6	141.4	484.7	266.6	1655.4
	125 yrs avg. to 2010	352	357	364	291	78	36	28	97	104	146	224	239	2316
Labasa	2010 actual	213.1	73.3	314.4	325.2	108	104	88.1	41.9	16.8	165.2	425.1	400.5	2275.6
	122 yrs avg. to 2010	362	358	378	237	110	65	47	50	103	100	205	254	2269
Penang	2010 actual	59.3	306.8	83.9	153.7	61.8	39.6	22.7	13.9	57.4	248.8	430.2	165	1643.1
	113 yrs avg. to 2010	434	350	408	382	122	69	52	91	86	145	154	242	2535

Appendix 3: Crop production details										
	Lautoka		Rarawai		Labasa		Penang		All mills	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Areas harvested (hectares)										
Plant	888	684	1038	1078	990	1086	272	220	3188	3068
First ratoon	634	822	843	1014	1392	1070	303	232	3172	3138
2nd ratoon	463	594	930	826	982	1236	336	243	2711	2899
Other ratoons	12477	11681	12329	10600	11776	10583	3352	2959	42645	35823
Total	14461	13780	15140	13519	15140	13974	4262	3654	49003	44927
Cane Harvested										
Plant	7.9	7.5	9.4	10.1	8.2	9.9	7.3	6.9	8.2	9.0
First ratoon	5.1	7.9	6.8	8.7	11.7	9.3	7.5	6.7	7.8	8.5
2nd ratoon	3.4	4.9	6.5	6.4	7.2	9.4	7.9	6.3	6.3	6.9
Other ratoons	83.6	79.6	77.4	74.8	72.9	71.3	77.4	80.1	77.8	75.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yield tonnes per hectare harvested										
Plant	64.9	58.2	59.4	48.8	56.1	50.6	48.6	55.0	57.3	52.0
First ratoon	58.8	51.0	53.2	44.6	57.1	48.3	44.8	51.1	53.5	48.0
2nd ratoon	52.7	43.6	45.9	40.6	49.8	42.3	42.5	45.3	47.7	42.3
Other ratoons	48.6	36.0	41.4	36.9	42.1	37.4	41.9	47.6	43.	37.6
Avg. yield/ha	50.2	38.3	43.6	38.6	44.9	39.7	42.6	48.1	45.3	39.6
Main varieties crushed according to tonnes (%)										
Ragnar	0.4	0.5	0.3	0.3	20.3	19.6	0.0	0.2	5.3	6.4
Aiwa	0.6	0.4	0.1	0.1	0.3	0.3	0.1	0.0	0.3	0.3
Beqa	0.0	0.1	0.0	0.0	0.3	0.2	0.0	0.0	0.1	0.1
Galoa	0.1	0.1	0.0	0.0	5.9	6.2	0.0	0.0	1.5	1.9
Kaba	2.2	2.6	3.4	4.9	0.3	0.2	0.0	0.6	1.5	2.4
Mali	0.0	0.0	0.0	0.0	12.7	13.1	0.4	0.4	3.3	4.1
Mana	94.2	93.8	93.5	91.8	0.1	0.0	94.6	94.5	70.6	64.1
Naidiri	1.8	1.5	1.5	1.7	28.5	31.3	4.2	4.0	9.0	11.1
Vatu	0.0	0.0	0.0	0.0	20.7	19.4	0.1	0.0	5.2	6.0
Waya	0.0	0.0	0.8	0.7	8.2	7.7	0.0	0.0	2.3	2.6
LF91-1925	0.3	0.4	0.2	0.0	0.1	1.4	0.0	0.0	0.2	0.6
Expt./Others	0.4	0.6	0.2	0.5	2.6	0.6	0.6	0.3	0.7	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix 4: Rainfall (mm) at mill centres										
Mill	For 12 months ended 31st December					For 12 months ended 30th September				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Lautoka	1844	2363	2502	2875	1299	1924	2054	2714	2983	899
Rarawai	2162	2805	3020	2591	1655	2111	2663	3115	2932	1101
Labasa	2153	2786	2448	2479	2275	2452	2208	2815	2709	1568
Penang	1824	2618	3384	3064	1643	1776	1991	3673	3165	1342

Appendix 5: **Rainfall distribution affecting 2010 crop(mm)**					
Month	**Period**	**Lautoka**	**Rarawai**	**Labasa**	**Penang**
Jul 09	Early	3.2	1.2	32.4	54
	Mid	30.4	28.2	669.6	326
	Late	-	-	34.3	-
Aug 09	Early	38.6	7.5	95.2	273
	Mid	26.3	18.4	118	137
	Late	-	1.1	16.4	106
Sep 09	Early	28	20.8	417	186
	Mid	195.4	194.9	666.5	887
	Late	-	18.4	26.9	63
Oct 09	Early	36.4	35.5	-	92
	Mid	5.4	21.4	14	24
	Late	-	-	-	4
Nov 09	Early	12.2	13.5	12	50
	Mid	1.6	32.4	38	122
	Late	6.8	1.8	4	110
Dec 09	Early	23.6	20	29	-
	Mid	213.2	202.5	134	-
	Late	0.5	-	1	-
Jan 10	Early	15.4	221	9.9	164
	Mid	58.4	61.2	87.1	130
	Late	21	44.5	29.1	299
Feb 10	Early	17	23.1	34	1313
	Mid	10.2	41.3	38	678
	Late	1.4	6.5	14	1077
Mar 10	Early	0.8	4.8	58.1	8
	Mid	24.5	34.8	223.2	485
	Late	111.6	126.6	32.5	328
Apr 10	Early	51.8	101.5	138.8	780
	Mid	5.6	23.3	21.2	259
	Late	86.6	41.9	165	498
May 10	Early	0.2	12.7	9	172
	Mid	11.4	22.7	30.8	234
	Late	12	21.6	70.1	202
Jun 10	Early	-	-	3	3
	Mid	3.4	0.7	96.5	322
	Late	-	0.1	3.8	71
Early - 1st to 10th of the month Mid - 11th to 20th of the month Late - 21st to end of the month					

Appendix 6: Hectares harvested											
Mills		**Average for period of five seasons**					**Last five seasons individually**				
		1981/ 1985	**1986/ 1990**	**1991/ 1995**	**1996/ 2000**	**2001/ 2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	Plt	5904	4007	3634	2944	1042	850	507	1009	888	684
	Rtn	18108	19743	20580	19701	19730	16275	15869	14258	13573	13096
	Total	24012	23750	24214	22645	20772	17125	16376	15267	14461	13780
Rarawai	Plt	4463	3574	2899	3164	1055	1651	975	894	1038	1078
	Rtn	13836	14805	17360	14613	17585	15476	15916	14828	14102	12441
	Total	18299	18379	20259	17777	18640	17127	16891	15722	15140	13519
Labasa	Plt	2365	2512	3120	2597	1269	1341	797	1366	990	1086
	Rtn	16306	17181	19604	18348	15911	15169	13839	14149	14150	12888
	Total	18671	19693	22724	20945	17180	16510	14636	15515	15140	13974
Penang	Plt	1697	1396	1386	1120	542	457	411	334	272	220
	Rtn	4036	5029	4958	4674	4568	4218	4244	4069	3990	3434
	Total	5733	6425	6344	5794	5110	4675	4655	4403	4262	3654
All mills	Plt	14429	11489	11039	9825	3908	4298	2690	3603	3188	3067
	Rtn	52286	56758	62502	57336	57794	51140	49868	47304	45815	41860
	Total	66715	68247	73541	67161	61702	55438	52558	50907	49003	44927

Appendix 7 : Tonnes of cane harvested										
Mills	**Average for period of five seasons**					**Last five seasons individually**				
	1981/ 1985	**1986/ 1990**	**1991/ 1995**	**1996/ 2000**	**2001/ 2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	1254266	1048942	1283569	1216597	971454	1051097	741231	770569	726046	527663
Rarawai	984244	1006366	1017374	957507	878509	1039474	738478	732165	659351	522114
Labasa	980634	1015166	1166055	1017061	840388	871031	769138	604314	679584	554575
Penang	310406	332592	291206	309205	239044	264498	229844	214572	181650	175701
All mills	3529550	3403066	3758204	3500370	2929395	3226100	2478691	2321620	2246631	1780053

Appendix 8 : Tonnes of cane per hectare harvested

Mills		Average for period of five seasons					Last five seasons individually				
		1981/1985	1986/1990	1991/1995	1996/2000	2001/2005	2006	2007	2008	2009	2010
Lautoka	Plt	61.7	65.4	64.7	64.2	63.9	81.9	65.6	65.7	64.9	58.2
	Rtn	48.0	54.2	51.2	51.4	45.9	59.1	43.5	49.1	49.2	37.2
	Total	51.4	55.5	52.4	53.7	46.8	61.4	45.3	50.5	50.2	38.3
Rarawai	Plt	65.1	64.3	61.2	62.1	59.6	72.7	55.4	57.9	59.4	48.8
	Rtn	51.3	52.0	48.1	52.9	46.4	57.7	41.6	44.6	42.4	37.7
	Total	53.3	54.2	50.1	53.9	47.1	60.2	43.7	46.6	43.6	38.6
Labasa	Plt	63.9	58.9	59.3	56.5	59.7	64.1	65.5	47.2	56.1	50.6
	Rtn	50.8	51.5	50.4	47.4	47.6	49.2	49.2	36.4	44.1	38.7
	Total	52.5	51.5	51.3	48.6	48.9	52.7	52.6	38.9	44.9	39.7
Penang	Plt	63.3	63.1	57.2	62.6	54.2	63.8	60.2	53.9	48.6	55.0
	Rtn	50.5	48.6	43.1	51.2	46.4	56.4	47.1	48.0	42.2	47.6
	Total	54.3	51.1	46.0	53.3	46.8	56.6	49.4	48.7	42.6	48.1
All	Plt	63.5	62.6	61.2	61.8	58.3	71.1	61.1	54.6	59.0	52.0
Mills	Rtn	49.5	55.8	48.1	50.0	46.0	55.9	44.7	45.0	44.9	38.7
	Total	52.6	53.3	50.2	52.1	47.5	58.2	47.2	45.6	45.8	39.6

Appendix 9 : Hectares harvested in relation to registered area and cultivated area (ha)

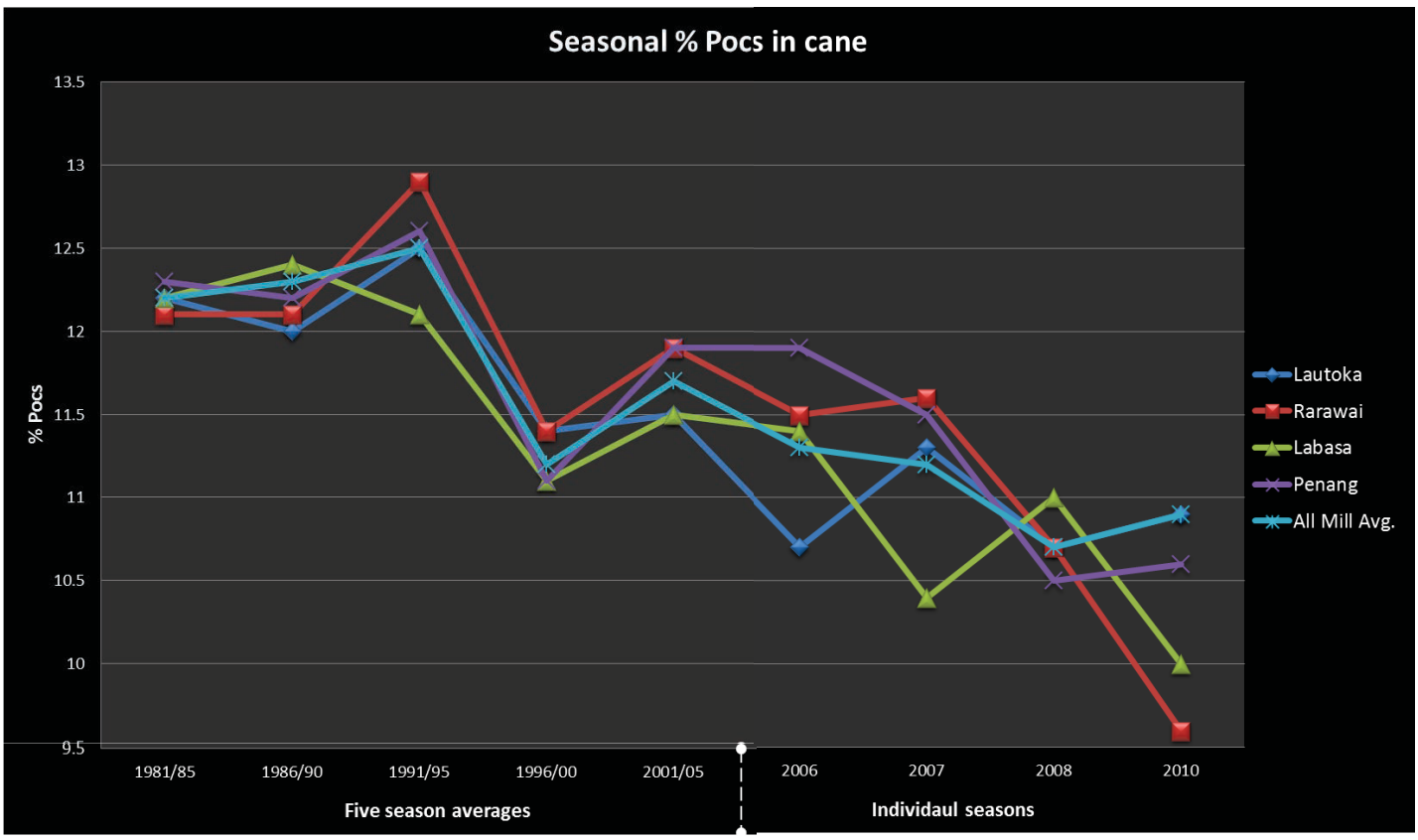
Mills	2010 hectares (A)			Hectares harvested as % of various categories "A"	
	Registered (1)	Cultivated (2)	Harvested	(1)	(2)
Lautoka	25155	15229	13780	57.8	90.5
Rarawai	22139	15040	13519	60.1	90
Labasa	18979	15922	13974	73.6	87.6
Penang	8897	5709	3654	41	64
Total	75170	51900	44927	60	86.6

Appendix 10 : Plant cane harvested as percentage of total area harvested

Mills	Average for period of five seasons					Last five seasons individually				
	1986/1990	1991/1995	1996/00	2001/05		2006	2007	2008	2009	2010
Lautoka	17	15	13	5		7	3	4	6	7.5
Rarawai	19	14	18	6		12	6	6	7	10.1
Labasa	13	14	12	7		10	5	9	7	9.9
Penang	22	23	19	11		11	9	8	6	6.9
All mills	17	16	15	7		10	5	6	7	9

Appendix 11: Plant and ratoon yields and percentage of total area harvested - 2010 Crop								
Mills	**Plant**		**First ratoon**		**Other ratoons**		**All cane**	
	tc/ha	**% Area**	**tc/ha**	**% Area**	**tc/ha**	**% Area**	**tc/ha**	**% Area**
Lautoka	58.2	5.0	51.0	6.0	36.0	84.8	45.2	100.0
Rarawai	48.8	8.0	44.6	7.5	36.9	74.8	38.6	100.0
Labasa	50.7	6.5	48.3	9.2	37.4	77.8	39.7	100.0
Penang	55.1	6.0	51.1	6.4	47.6	81.0	48.1	100.0
All Mills	52.0	6.8	48.0	7.0	37.6	79.7	39.6	100.0

Appendix 12 : Seasonal %POCS in cane										
Mills	**Rough average for period of five seasons**					**Last five seasons individually**				
	1981/85	**1986/90**	**1991/95**	**1996/00**	**2001/05**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	**12.2**	**12.0**	**12.5**	**11.4**	**11.5**	**10.7**	**11.3**	**10.7**	**10.2**	**10.9**
Rarawai	12.1	12.1	12.9	11.4	11.9	11.5	11.6	10.7	NA	9.6
Labasa	12.2	12.4	12.1	11.1	11.5	11.4	10.4	11.0	10.8	10.0
Penang	12.3	12.2	12.6	11.1	11.9	11.9	11.5	10.5	NA	10.6
All Mill Avg.	12.2	12.3	12.5	11.2	11.7	11.3	11.2	10.7		10.9



Appendix 13: Weekly POCS in cane 2010 season

Week no.	Week ending	Lautoka	Rarawai	Labasa	Penang
1	07-Jun-2010				9.05
2	14-Jun-2010				8.96
3	21-Jun-2010				8.95
4	28-Jun-2010	9.69		10.45	9.31
5	05-Jul-2010	9.74	9.5	9.67	9.69
6	12-Jul-2010	1016	9.34	10.16	9.80
7	19-Jul-2010	10.40	9.86	10.53	10.31
8	26-Jul-2010	10.27	9.83	10.60	10.38
9	02-Aug-2010	10.59	9.82	10.33	10.72
10	09-Aug-2010	10.53	9.64	10.76	10.99
11	16-Aug-2010	10.75	10.13	10.48	11
12	23-Aug-2010	10.85	10.00	10.60	10.72
13	30-Aug-2010	10.91	11.20	10.70	10.78
14	06-Sep-2010	11.15	11.06	9.67	
15	13-Sep-2010	11.61	10.74	9.42	9.59
16	20-Sep-2010	11.53	11	9.17	11.54
17	27-Sep-2010	11.80	9.59	11.17	11.75
18	04-Oct-2010	11.15	8.66	12.12	11.72
19	11-Oct-2010	11.60	10.37	11.58	11.55
20	18-Oct-2010	11.00	11.62	11.57	11.05
21	25-Oct-2010	11.93	10.81	10.61	11.86
22	01-Nov-2010	10.76	11.41	10.31	11.11
23	08-Nov-2010	11.36	10.93	10.42	11.64
24	15-Nov-2010	11.17	10.81	10.04	10.68
25	22-Nov-2010	10.03	9.16	9.27	9.54
26	29-Nov-2010	10.29	8.52		
27	6-Dec-2010	9.16	10		
28	13-Dec-2010		8.95		
29	20-Dec-2010		8.32		
30	27-Dec-2010		7.62		
31	03-Jan-2010		7.1		
32	10-Jan-2010		6.55		
33	17-Jan-2010		4.92		
34					
35					
36					
37					
Season Average		10.88	9.6		10.58

Appendix 14 : Sugar produced (tonnes 94 N.T. equivalent) from area harvested							
Mills	**Tonnes sugar 94 N.T equivalent**						
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	110684	97315	96875	75656	77311	53313	43384
Rarawai	100664	84258	106781	78786	63954	42222	31580
Labasa	87802	90347	83970	68255	53160	57548	40943
Penang	24716	24733	30937	21858	23231	22818	18530
All mills	323866	296653	318563	244555	217656	175901	134436

Appendix 15 : Sugar per hectare harvested (tonnes 94 N.T equivalent)										
Mills	**Average for period of five seasons**					**Last five seasons individually**				
	1981/ 1985	**1986/ 1990**	**1991/ 1995**	**1996/ 2000**	**2001/ 2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	5.97	6.55	6.15	5.61	4.92	5.60	4.62	5.06	3.69	3.15
Rarawai	6.38	6.36	6.29	5.61	5.38	6.23	4.66	4.06	2.79	2.34
Labasa	6.20	6.20	6.00	4.95	4.97	5.09	4.66	3.43	3.80	2.93
Penang	6.34	5.70	5.47	5.42	4.65	6.63	4.70	5.28	5.35	5.07
Average	6.21	6.28	6.05	5.39	5.06	5.75	4.65	4.28	3.59	2.99

Appendix 16 : Length of season (weeks) - Start and finish of crushing (date)										
Mills	**Rough average for period of five seasons**					**Last five seasons individually**				
	1981/ 1985	**1986/ 1990**	**)91/ 1995**	**1996/ 2000**	**2001/ 2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Lautoka	29.3	28.8	28.0	29.7	27.6	32.4	24.0	23.9	31.4	23.3
						05 Jun	07 Jun	10 Jun	22 Jun	24 Jun
						11 Jan	18 Nov	21 Nov	25 Jan	4 Dec
Rarawai	26.4	26.2	25.3	26.5	24.2	30.8	23.8	25.7	31.5	28.0
						31 May	18 Jun	23 Jun	03 Jul	28 Jun
						01 Jan	18 Nov	15 Dec	03 Feb	11 Jan
Labasa	27.9	26.6	29.4	30.7	24.1	29.0	29.1	26.0	25.6	28.1
						06 Jun	06 Jun	30 Jun	09 Jun	22 Jun
						25 Dec	25 Dec	22 Dec	18 Dec	29 Dec
Penang	28.1	25.5	21.5	26.2	20.4	21.4	22.1	22.2	22.4	24.6
						20 Jun	06 Jun	11 Jun	19 May	6 Jun
						16 Nov	06 Nov	13 Nov	22 Oct	20 Nov
All mills	28.4	26.8	26.1	28.2	24.1	28.4	24.8	24.5	28.3	23.3

Appendix 17 : Varieties Percent of hectares harvested

	Lautoka		Rarawai		Labasa		Penang		All Mills	
Varieties	**2009**	**2010**	**2009**	**2010**	**2009**	**2010**	**2009**	**2010**	**2009**	**2010**
Ragnar	0.4	0.5	0.3	0.3	20.3	19.6	-	0.2	5.3	6.4
Waya	-	-	0.8	0.7	8.2	7.7	-	-	2.3	2.6
Mali	-	-	-	-	12.7	13.1	0.4	0.4	3.3	4.1
Homer	-		-		-		-	-	-	
Spartan	-		-		-		-	-	-	
Galoa	0.1	0.1	-	-	5.9	6.2	-	-	1.5	1.9
Aiwa	0.6	0.4	0.1	0.1	0.3	0.3	0.1	-	0.3	0.3
Kuiva	-	0.1	-	-	-		-	-	-	
Yasawa	-		-		-		-	-	-	
Vomo	-		-		-		-	-	-	
Mana	94.2	94	93.5	91.8	0.1	-	94.6	94.5	70.6	64.1
LF 91 - 1925	0.3	0.4	0.2	-	0.1	1.4	-		0.2	0.6
Kaba	2.2	2.6	3.4	4.9	0.3	0.2	0.6	0.6	1.6	2.4
Vatu	-	-	-	-	20.7	19.4	0.1	-	5.2	6.0
Beqa	-	0.1	-	-	0.3	0.2	-	-	0.1	0.1
Naidiri	1.8	1.5	1.5	1.7	28.5	31.3	4.2	4	9.0	11.1
Exp.	-	-	-	-	-		-	-	-	
Other var.	0.2	0.4	0.3	0.3	2.5	0.6	-	0.3	0.8	0.4

Appendix 18: Area planted in hectares as % of registered and cultivated areas

	Hectares planted		Hectares planted as % of registered area		Hectares planted as % of cultivated area	
	2009	**2010**	**2009**	**2010**	**2009**	**2010**
Lautoka	767	1698	3.1	6.6	5.3	11.5
Rarawai	1251	1623	5.9	7.3	7.0	10.8
Labasa	1337	2357	7.0	12.4	7.9	14.8
Penang	208	792	2.3	8.9	4.7	13.8
Total	3563	6470	5.0	8.6	6.2	12.5

Appendix 19: Planting of varieties as percentage of total area planted over three years

Year	Varieties	Lautoka	Rarawai	Labasa	Penang	All mills
2008	Ragnar	0.4	0.1	8.4	-	-
2009		6.3	-	10.4	-	-
2010		0.4	0.3	16.6	0.1	-
2008	Waya	-	-	7.1	-	-
2009		-	0.4	9.3	-	-
2010		-	0.6	7.0	-	-
2008	Mana	93.5	91.2	-	94.4	-
2009		80.2	91.4	-	98.7	-
2010		85.3	83.2	-	61.8	-
2008	Galoa	0.1	-	7.7	-	-
2009		-	-	5.1	-	-
2010		0.06	-	5.4	-	-
2008	Vatu	-	-	7.6	-	-
2009		0.2	-	7.7	-	-
2010		-	-	17.6	-	-
2008	Mali	-	-	9.8	0.9	-
2009		-	-	13.8	0.3	-
2010		-	0.05	11.8	0.3	-
2008	Aiwa	0.5	-	0.4	-	-
2009		0.4	-	2.0	-	-
2010		0.34	0.1	0.3	-	-
2008	Beqa	0.1	-	-	-	-
2009		0.3	-	-	-	-
2010		0.02	-	0.2	-	-
2008	Kaba	2.7	5.4	0.3	-	-
2009		0.1	5.7	-	-	-
2010		2.5	4.1	0.2	0.5	-
2008	Naidiri	2.2	2.1	57.7	4.4	-
2009		1.9	1.3	50.1	-	-
2010		1.36	1.2	27	3.4	-
2008	Homer	-	-	-	-	-
2009		-	-	-	-	-
2010		-	-	-	-	-
2008	Kiuva	-	-	-	-	-
2009		1.3	-	-	-	-
2010		0.03	-	-	-	-
2008	LF91-1925	0.3	0.4	-	-	-
2009		1.7	-	1.0	-	-
2010		0.27	0.02	1.3	-	-
2008	Other Varieties	-	0.8	0.9	0.2	-
2009		1.0	1.2	0.6	1.0	-
2010		0.23	0.2	0.5	0.1	-

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	202130	23	671954	75	890779	100
	2006	11854	1	174057	17	865186	82	1051097	100
	2007	13652	2	158002	21	569577	77	741231	100
	2008	15915	2	179905	24	574754	74	770567	100
	2009	12464	2	168852	23	544730	75	726046	100
	2010	3964	1	129410	25	394094	75	527468	100
Rarawai	2005	40601	5	223857	29	497246	66	761704	100
	2006	44731	4	239872	23	754871	73	1039474	100
	2007	32927	5	184605	25	520946	70	738478	100
	2008	38797	5	184094	25	509470	70	732165	100
	2009	23827	4	164490	25	471034	71	659351	100
	2010	25106	5	126450	24	370460	71	522016	100
Labasa	2005	18563	2	249669	27	642431	71	910663	100
	2006	3391	1	238591	27	629049	72	871031	100
	2007	2910		233371	31	532847	69	769138	100
	2008	1275		179815	30	423224	70	604314	100
	2009			230735	34	448849	66	679584	100
	2010			171042	34	383485	66	554527	100
Penang	2005	1191.3	5	38421	17	175260	78	225594	100
	2006	3681	1	63499	24	197318	75	264498	100
	2007	3010	1	55450	24	171378	75	229838	100
	2008	3026	1	48285	23	163261	76	214572	100
	2009	11145	6	30977	17	139528	77	181650	100
	2010			44447	25	131254	75	175701	100
All mills	2005	87772	3	714077	26	1986891	71	2788740	100
	2006	63657	2	716019	22	2446424	76	3226100	100
	2007	52509	2	128061	16	2298115	82	2478685	100
	2008	59013	3	592099	26	1670704	72	2321620	100
	2009	47436	2	595054	26	1604141	71	2246631	100
	2010	29070	1.6	471349	26.5	1279293	72	1779712	100

Appendix 21: Percentage burnt cane of total tonnes crushed

Year	Lautoka	Rarawai	Labasa	Penang	Average
1969	14.9	17.8	0.5	11.0	11.1
1970	8.7	8.9	0.6	4.7	5.7
1971	18.7	26.1	6.4	12.9	16.0
1972	10.7	13.4	0.9	8.9	8.5
1973	17.0	22.4	2.7	4.6	11.7
1974	24.9	36.5	5.1	20.7	21.8
1975	18.2	29.1	3.6	14.1	16.3
1976	12.9	28.0	4.9	15.1	15.2
1977	17.7	28.9	6.9	11.8	16.3
1978	19.1	25.3	9.6	8.2	15.6
1979	14.9	25.9	9.6	15.0	16.4
1980	21.5	27.4	16.0	18.0	20.7
1981	17.6	21.2	19.4	17.0	18.8
1982	23.2	24.8	13.6	13.2	18.7
1983	18.3	18.4	18.0	12.0	16.7
1984	25.1	8.2	12.9	10.0	14.1
1985	28.6	25.2	22.4	16.2	23.1
1986	29.5	15.1	15.1	11.3	17.8
1987	23.8	34.2	20.9	19.0	24.5
1988	37.7	15.2	16.0	19.2	22.0
1989	20.6	13.6	12.7	10.0	14.2
1990	24.3	30.4	13.7	14.6	20.8
1991	42.5	46.4	32.0	27.6	37.1
1992	52.5	52.1	44.4	41.1	47.5
1993	35.6	33.4	29.2	19.4	29.4
1994	39.0	36.0	27.0	19.8	30.5
1995	43.4	42.5	37.6	28.7	38.1
1996	54.8	48.1	39.9	33.2	44.0
1997	50.7	49.1	33.5	34.8	42.0
1998	67.0	67.7	54.5	44.6	58.5
1999	41.6	39.8	17.0	26.3	32.4
2000	56.1	54.6	37.8	49.0	50.6
2001	56.7	50.3	18.9	49.5	42.9
2002	46.8	41.8	21.4	33.9	37.1
2003	40.1	32.8	29.3	22.0	33.4
2004	42.7	39.5	18.3	35.5	34.3
2005	44.4	38.4	25.0	34.9	35.7
2006	60.5	58.5	34.4	46.5	51.7
2007	39.0	40.5	39.1	53.5	40.8
2008	50.9	53.6	49.1	48.5	51.1
2009	43.5	33.3	18.6	28.8	31.8
2010	30.4	33.6	18.6	16.3	25

Approved Varieties

The list of sugarcane varieties approved for planting during 2010 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.

Lautoka			
Sectors	Soil types	Varieties recommended on maturity trends	
		Early - mid	Mid - Late
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
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
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
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
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
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
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
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
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
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	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
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
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
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			
Sectors	**Soil types**	**Varieties**	
		Early - mid	**Mid - Late**
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
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
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
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
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	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
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
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
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
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

Labasa			
Sectors	**Soil types**	**Varieties**	
		Early - mid	**Mid - Late**
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
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
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	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
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
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
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

Natua	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali
Solove	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali
Bulivou	Poor soils	Aiwa, Beqa, Naidiri, LF91-1925	Ragnar, Kaba, Mali

Penang			
Sectors	**Soil types**	**Varieties**	
		Early - mid	**Mid - Late**
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
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
Ellington I & II	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

Varieties released in the last decade

Picture 1: Naidiri (2000)

Picture 2: LF91-1925 (2006)

Picture 3: Kiuva (2009)

Sugar Research Institute of Fiji

Financial Statements

For the year ended

31 December 2010

Sugar Research Institute of Fiji

Contents

Sugar Research Institute of Fiji

Board report

The Board members present their report together with the financial statements of the Institute for the year ended 31 December 2010 and the auditor's report thereon.

Board members

The Board members in office at the date of this report are:
Dr John Morrison - Chairman
Sundresh Chetty
Viliame Gucake
Dr. Krishnamurthi
Suresh Patel
Mangaiya Reddy
Seru Vularika

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 2010 and the accompanying statement of 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.

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 Board members, 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 16th day of September 2011.

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,

Report of the independent auditor for Sugar Research Institute of Fiji

Scope

We have audited the financial statements of Sugar Research Institute of Fiji for the financial year ended 31 December 2010, consisting of the statement of financial position, statement of comprehensive income, statement of cash flows and accompanying notes, set out on pages 3 to 20. The Board members are responsible for the preparation and presentation of the financial statements and the information they contain. We have conducted an independent audit of these financial statements in order to express an opinion on them to you.

Our audit has been conducted in accordance with Section 12 of the Sugar Research Institute Act 2005 and International Standards on Auditing, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with International Financial Reporting Standards so as to present a view which is consistent with our understanding of the Institute's financial position, the results of its operations and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

Audit opinion

In our opinion, the accompanying financial statements give a true and fair view of the financial position of the Institute for the year ended 31 December 2010 and of the results of its operations and its cash flows for the year then ended in accordance with International Financial Reporting Standards.

10 September 2011
Nadi, Fiji Islands

KPMG
KPMG
Chartered Accountants

Sugar Research Institute of Fiji
Statement of comprehensive income
For the year ended 31 December 2010

	Note	2010 $	2009 $
Contributions and grants	5	2,831,840	1,872,481
Estate income		755,201	1,203,413
Other income		27,110	14,246
Total income		3,614,151	3,090,140
Cost of operations		(1,405,524)	(2,226,955)
Administrative expenses		(2,154,706)	(859,347)
Surplus from operations	6	53,921	3,838
Finance expense	7	(4,361)	(3,838)
Surplus before tax		49,560	-
Income tax expense	8	(49,560)	-
Surplus after income tax		-	-
Other comprehensive income net of income tax		-	-
Total comprehensive surplus for the year		-	-

The above statement of comprehensive income is to be read in conjunction with notes to the financial statements set out on pages 6 to 20.

Sugar Research Institute of Fiji
Statement of financial position
As at 31 December 2010

	Note	2010 $	2009 $
Assets			
Non-current assets			
Property, plant and equipment	9	3,003,668	1,719,825
Total non-current assets		3,003,668	1,719,825
Current assets			
Cash and cash equivalents	10	727,629	774,040
Receivables and prepayments	11	48,467	14,126
Receivable from related parties	15(b)	4,295,366	3,502,060
Total current assets		5,071,462	4,290,226
Total assets		8,075,130	6,010,051
Current liabilities			
Deferred income	12	3,736,273	3,052,836
Payable to related parties	15(c)	4,022,442	2,455,415
Employee benefits	13	33,060	35,108
Trade and other payables	14	233,795	466,692
Provision for income tax	8	49,560	-
Total current liabilities		8,075,130	6,010,051
Total liabilities		8,075,130	6,010,051

Signed on behalf of the board

Chairman **Board Member**

The above statement of financial position is to be read in conjunction with notes to the financial statements set out on pages 6 to 20.

Sugar Research Institute of Fiji
Statement of cash flows
For the year ended 31 December 2010

	Note	2010 $	2009 $
Operating activities			
Receipts from stakeholders and donors		2,440,856	3,902,062
Payment to suppliers and employees		(1,977,332)	(3,977,535)
Cash flows (used in)/ from operating activities		463,524	(75,473)
Investing activities			
Proceeds from sale of property, plant and equipment		22,391	10,300
Acquisition of property, plant and equipment		(1,539,020)	(1,066,487)
Cash flows used in investing activities		(1,516,629)	(1,056,187)
Financing activities			
Repayment of related party advance		-	(200,000)
Grant income from stakeholders		1,006,694	-
Cash flows used in financing activities		1,006,694	(200,000)
Net decrease in cash and cash equivalents		(46,411)	(1,331,659)
Cash and cash equivalents at the beginning of the year		774,040	2,105,699
Cash and cash equivalents at 31 December	10	727,629	774,040

The above statement of cash flows is to be read in conjunction with notes to the financial statements set out on pages 6 to 20.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

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 International Financial Reporting Standards (IFRS) adopted by International Accounting Standards Board.

The financial statements were authorised for issue by the Board on 10 September 2011.

(b) Basis of measurement

The financial statements have been prepared on the historical cost basis except where stated. The accounting policies have been consistently applied by the Institute and are consistent with those used in the previous period.

(c) Functional and presentation currency

The financial statements are presented in Fiji dollars which is the Institute's functional currency.

(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.

Information about critical judgments in applying accounting policies that have the most significant effect on the amount recognised in the financial statements are described in the following notes:

(i) Note 5 - Contributions and grants

(ii) Note 12 - Deferred income

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

3. Significant accounting policies

The principal accounting policies adopted by the Institute are stated to assist in a general understanding of the financial statements. These policies have been consistently applied except where otherwise indicated.

(a) Income tax

Income tax expense comprises current and deferred tax. Current tax and deferred tax is recognised in the profit or loss except to the extent that it relates to items recognised directly in equity, in which case it is recognised in equity.

Current tax is the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustments to tax payable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss.

Deferred tax is measured at the tax rates that are expected to be applied to the temporary difference when they reverse, based on the laws that have been enacted or substantively enacted by the reporting date.

Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax liabilities and assets, and they relate to income taxes levied by the same tax authority on the same taxable entity, or on different tax entities, but they intend to settle current tax liabilities and assets on a net basis or their tax assets and liabilities will be realised simultaneously.

A deferred tax asset is recognised for unused tax losses, tax credits and deductible temporary differences, to the extent that it is probable that future taxable profits will be available against which they can be utilised. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

3. Significant accounting policies (continued)

(b) 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 translated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on translation are recognised in profit or loss.

(c) Property, plant and equipment

Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

The gain or loss on disposal of an item of property, plant and equipment is determined by comparing the proceeds from disposal with the carrying amount of the property, plant and equipment, and is recognised net within other income/other expenses in profit or loss.

Subsequent expenditure

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 benefits embodied within the part will flow to the Institute and its cost can be measured reliably. The costs of the day-to-day servicing of property, plant and equipment are recognised in the profit or loss as incurred.

Depreciation

Depreciation is based on the cost of an asset less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately.

Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment. Leased assets are depreciated over the shorter of the lease term and their useful lives unless it is reasonably certain that the Institute will obtain ownership by the end of the lease term. Freehold land is not depreciated.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

3. Significant accounting policies (continued)

(c) Property, plant and equipment (continued)

Depreciation (continued)

The estimated useful lives for the current and comparative years are as follows:

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.

(d) Impairment

(i) Non-derivative financial assets

A financial asset not carried at fair value through profit or loss is 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.

Loans and receivables

The Institute considers evidence of impairment for loans and receivables at both a specific asset and collective level. All individually significant receivables are assessed for specific impairment. All individually significant loans and receivables found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Loans and receivables that are not individually significant are collectively assessed for impairment by grouping together loans and receivables and held-to-maturity investment securities with similar risk characteristics.

An impairment loss in respect of a financial asset measured at amortised cost is calculated as the difference between its carrying amount and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognised in profit or loss and reflected in an allowance account against loans and receivables. When a subsequent event causes the amount of impairment loss to decrease, the decrease in impairment loss is reversed through profit or loss.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

3. Significant accounting policies (continued)

(d) Impairment (continued)

(i) Non-derivative financial assets (continued)

(ii) Non-financial assets

The carrying amounts of the Institute's non-financial assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated.

The recoverable amount of an asset or cash-generating unit is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or groups of assets (the "cash-generating unit, or CGU").

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its estimated recoverable amount. Impairment losses are recognised in the profit or loss. Impairment losses recognised in respect of cash-generating units are allocated first to reduce the carrying amount of any goodwill allocated to the units and then to reduce the carrying amounts of the other assets in the unit (group of units) on pro rata basis.

An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(e) Financial instruments

Non derivative financial instrument

The Institute initially recognises loans and receivables and deposits on the date that they are originated. All other financial assets are recognised initially on the trade date, which is the date that 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 2010

3. Significant accounting policies (continued)

(e) Financial instruments (continued)

Non derivative financial instrument (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 the following categories: financial assets at fair value through profit or loss, held-to-maturity financial assets, loans and receivables and available-for-sale financial assets.

Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are recognised initially 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, less any impairment losses.

Loans and receivables comprise cash and cash equivalent, trade and other receivables and receivables from related parties.

Cash and cash equivalents

Cash and cash equivalents comprise cash at bank and on hand for the purposes of the statement of cash flows.

(ii) Non-derivative financial liabilities

Receivables and other assets

Receivables and other assets are measured at initial recognition at fair value. Subsequently, appropriate allowances for estimated irrecoverable amounts are recognised in the profit or loss when there is objective evidence that the asset is impaired.

Financial liabilities

Financial liabilities are classified according to the substance of the contractual arrangements entered into. The Institute's financial liabilities include trade and other payables. All financial liabilities, except for derivatives, are recognised initially at their fair value plus transaction costs that are directly attributable to the acquisition or issue of the financial liability and subsequently measured at amortised cost, using effective interest method, unless the effect of discounting would be insignificant, in which case they are stated at cost.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

3. Significant accounting policies (continued)

(f) Trade payables and other payables

Trade and other payables are non-interest-bearing and are stated at cost. A provision is recognised in the statement of financial position when the Institute has a legal or constructive obligation as a result of a past event, and it is probable that an outflow of economic benefits will be required to settle the obligation. If the effect is material, provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and, where appropriate, the risks specific to the liability.

(g) Revenue

Grant income

An unconditional government grant related to an asset is recognised in profit or loss as other income when the grant becomes receivable.

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 and are then recognised in profit or loss as other income on a systematic basis over the useful life of the asset. Grants that compensate the Institute for expenses incurred are recognised in profit or loss as other income on a systematic basis in the same periods in which the expenses are recognised.

(h) Employee benefits

Superannuation

Obligations for contributions to the Fiji National Provident Fund (FNPF) are recognised as an expense in the profit or loss when they are incurred.

Short-term benefits

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

(i) Finance expenses

Finance expense comprise bank charges.

(j) Comparative information

Where necessary, comparative figures have been adjusted to conform to changes in current year presentation.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

4. Financial risk management

Overview

The Institute has exposure to the following risks:

(i) Credit risk
(ii) Liquidity risk
(iii) Market risk

This note presents information about the Institute's exposure to each of the above risks, the Institute's objectives, policies and processes for measuring and managing risk. Further quantitative disclosures are included throughout these financial statements.

The Board members have overall responsibility for the establishment and oversight of the Institute's risk management framework.The Board is responsible for developing and monitoring the Institute's risk management policies. The Institute's risk management policies are established to identify and analyse the risks faced by the Institute, to set appropriate risk limits and controls, and to monitor risks and adherence to limits. Risk management policies and systems are reviewed regularly to reflect changes in market conditions and the Institute's activities. The Sugar Research Institute of Fiji, through its training and management standards and procedures, aims to develop a disciplined and constructive control environment in which all employees understand their roles and obligations.

The Board oversees how management monitors compliance with the Institute's risk management policies and procedures, and reviews the adequacy of the risk management framework in relation to the risks faced by the Institute.

(i) Credit risk

Credit risk is the risk of financial loss to the Institute if a stakeholder to a financial instrument fails to meet its contractual obligations, and arises principally from the Institute's receivables from industry related entities.

Trade and other receivables

The Institute's exposure to credit risk is influenced mainly by the individual characteristics of each party. However, management also considers the demographics of the Institute's stakeholders, including the default risk of the industry as these factors may have an influence on credit risk, particularly in the currently deteriorating economic circumstances.

The Institute establishes an allowance for impairment that represents its estimate of incurred losses in respect of trade and other receivables. The main components of this allowance are a specific loss component that relates to individually significant exposures, and a collective loss component established for groups of similar assets in respect of losses that have been incurred but not yet identified. The collective loss allowance is determined based on historical data of payment statistics for similar financial assets.

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

4. Financial risk management policies (continued)

(i) Credit risk (continued)

The maximum exposure to credit risk is as follows:

	2010	2009
	$	$
Cash and cash equivalents	727,629	774,040
Other receivables	44,898	297
Receivables from related parties	4,295,366	3,502,060
	5,067,893	4,276,397

(ii) Liquidity risk

Liquidity risk is the risk that the Institute will not be able to meet its financial obligations as they fall due. The Institute's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Institute's reputation.

	2010	2010	2009	2009
	$	$	$	$
	Less than 1 year	More than 1 year	Less than 1 year	More than 1 year
Financial assets				
Cash and cash equivalents	727,629	-	774,040	-
Receivables	44,898	-	297	-
Receivable from related parties	4,295,366		3,502,060	
	5,067,893	-	4,276,397	-
Financial liabilities				
Payable to related parties	4,022,442	-	2,455,415	-
Employee benefits	33,060	-	35,108	-
Trade and other payables	233,795	-	466,692	-
	4,289,297	-	2,957,215	-

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

4. Financial risk management policies (continued)

(iii) Market risk

Market risk is the risk that changes in interest rates will affect the Institute's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

Fair value interest risk arises from the potential for a change in interest rates to cause a fluctuation in the fair value of financial instruments. The objective is to manage the interest risk to achieve stable and sustainable net interest earnings in the long term. In managing the risk, the Institute seeks to achieve a balance between reducing risk to earnings and market value from adverse interest rate movements, and enhancing net interest income through correct anticipation of the direction and extent of interest rate changes.

5. Contributions and grants

Contributions from stakeholders and grants that compensate the Institute for revenue and capital expenditure

	2010	2009
	$	$
AusAid	-	75,390
Contribution from the Fiji Government	682,892	501,004
European Union	870,895	421,833
Fiji Sugar Corporation (FSC)	642,270	441,851
Sugar Cane Growers Council	635,783	432,403
	2,831,840	1,872,481

6. Surplus from operations

(a) Surplus from operations has been arrived at after including the following items:

	2010	2009
	$	$
Auditors remuneration - audit	8,500	8,500
- other services	3,561	4,172
Board allowances	-	832
Board fees	36,750	31,480
Depreciation	255,177	178,478
FSC costs	1,392,913	208,134
Gain on sale of property, plant and equipment	22,391	10,300
Insurance	46,355	57,064
Legal fees	10,786	11,311

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

6. Surplus from operations (continued)

(b) Personnel expenses	**2010**	**2009**
	$	**$**
Fiji National Provident Fund contributions	50,054	58,111
Training and Productivity Authority of Fiji	4,897	6,206
Key management compensation - short term benefits	143,449	145,913
Wages and salaries	345,933	468,464
	544,333	678,694

The average number of employees for the year ended 31 December 2010 was 26 (2009: 31)

7. Finance expense		
Bank charges	4,361	3,838

8. Income tax expense	**2010** **$**	**2009** **$**
(a) Recognised in profit or loss		
Current tax expense	49,560	-
Reconciliation of effective tax rate		
Operating loss before income tax	49,560	-
The prima facie income tax benefit on operating loss	13,877	-
Tax effect of permanent differences	36,257	-
Temporary differences not brought to account	(574)	-
Income tax expense	49,560	-

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

9. Property, plant and equipment

	Fixtures & fittings	Plant & equipment	Motor vehicles	Computers	Work in progress	Total
	$	$	$	$	$	$
Cost						
Balance at 1 January 2009	5,227	115,727	722,319	139,926	125,867	1,109,066
Acquisitions	28,438	440,220	268,860	98,111	230,858	1,066,487
Disposals	-	(4,000)	-	-	-	(4,000)
Balance as at 31 December 2009	33,665	551,947	991,179	238,037	356,725	2,171,553
Acquisitions	10,267	157,404	75,556	5,120	1,290,673	1,539,020
Disposals	-	-	(15,000)	-	-	(15,000)
Balance as at 31 December 2010	43,932	709,351	1,051,735	243,157	1,647,398	3,695,573
Depreciation						
Balance at 1 January 2009	649	60,520	185,988	30,093	-	277,250
Depreciation charge	2,094	20,780	122,107	33,497	-	178,478
Disposals	-	(4,000)	-	-	-	(4,000)
Balance at 31 December 2009	2,743	77,300	308,095	63,590	-	451,728
Depreciation charge	3,452	52,694	150,400	48,631	-	255,177
Disposals	-	-	(15,000)	-	-	(15,000)
Balance at 31 December 2010	6,195	129,994	443,495	112,221	-	691,905
Carrying amount						
At 1 January 2009	4,578	55,207	536,331	109,833	125,867	831,816
At 31 December 2009	30,922	474,647	683,084	174,447	356,725	1,719,825
At 31 December 2010	37,737	579,357	608,240	130,936	1,647,398	3,003,668

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

		2010	2009
		$	$
10.	**Cash and cash equivalents**		
	Cash at bank	727,344	773,838
	Cash on hand	285	202
	Cash and cash equivalents in the statement of cash flows	727,629	774,040
11.	**Receivables and prepayments**		
	Receivable from European Union	42,131	-
	Other receivables	2,767	297
	Prepayments	3,569	13,829
		48,467	14,126
12.	**Deferred income**		
	Balance at the beginning of the year	3,052,836	3,064,783
	Funds received or receivable during the period	3,515,277	1,860,534
	Utilised during the period	(2,831,840)	(1,872,481)
	Balance at 31 December	3,736,273	3,052,836
	This is comprised as follows:		
	Contribution from stakeholders	2,445,577	2,336,241
	European Union grant	1,290,696	716,595
		3,736,273	3,052,836
13.	**Employee benefits**		
	Accrued annual leave	33,060	35,108
14.	**Trade and other payables**		
	Trade payables	26,287	73,847
	Other payables	28,540	104,952
	VAT payable	178,968	287,893
		233,795	466,692

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

15. 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 current Board members of the Institute:
Dr John Morrison - Chairman
Sundresh Chetty
Viliame Gucake
Dr. Krishnamurthi
Suresh Patel
Mangaiya Reddy
Seru Vularika

Board members emoluments and board expenses are disclosed under Note 6.

		2010	2009
		$	$
(b)	**Amounts receivable from related parties**		
	Fiji Sugar Corporation	3,395,366	2,795,366
	Sugar Cane Growers Council	900,000	706,694
		4,295,366	3,502,060
(c)	**Amounts payable to related parties**		
	Fiji Sugar Corporation	4,022,442	2,455,415
		4,022,442	2,455,415
(d)	**Transactions with related parties**		
	Revenue		
	Grant income - Fiji Sugar Corporation	642,270	441,851
	Grant income - Fiji Government	682,892	501,004
	Grant income - Sugar Cane Growers Council	635,783	432,403
	Estate income - Fiji Sugar Corporation	755,201	1,203,413
		2,716,146	2,578,671
	Expenses		
	Fiji Sugar Corporation costs	1,392,913	208,134

Sugar Research Institute of Fiji
Notes to the financial statements
For the year ended 31 December 2010

15. Related parties (continued)

(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 6(b).

16. Capital commitments and contingencies

Capital commitments and contingent liabilities as at 31 December 2010 amounted to $Nil (2009: $Nil).

17. 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 Board members, 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.

Disclaimer

The additional financial information presented on pages 22 to 24 is in accordance with the books and records of Sugar Research Institute of Fiji which have been subjected to the auditing procedures applied in our statutory audit of the Institute for the year ended 31 December 2010. It will be appreciated that our statutory audit did not cover all details of the additional financial information. Accordingly, we do not express an opinion on such financial information and no warranty of accuracy or reliability is given.

In accordance with our firm policy, we advise that neither the Firm nor any member or employee of the Firm undertakes responsibility arising in any way whatsoever to any person (other than the Institute) in respect of such information, including any errors or omissions therein, arising through negligence or otherwise however caused.

10 September 2011
Nadi, Fiji Islands

KPMG
KPMG
Chartered Accountants

Sugar Research Institute of Fiji
Statement of Operations
For the year ended 31 December 2010

	2010	2009
	$	$
Income		
Contribution from the Fiji Government	682,892	501,004
Fiji Sugar Corporation (FSC) contribution	642,270	441,851
Grant received from AusAid	-	75,390
Grant received from European Union	870,895	421,833
Sugar Cane Growers Council contribution	635,783	432,403
Estate income	755,201	1,203,413
Gain on sale of property, plant and equipment	22,391	10,300
Sundry income	4,719	3,946
Total income	3,614,151	3,090,140
Less cost of operations		
Bank charges	4,361	3,838
Depreciation	255,177	178,478
Electricity	798	1,534
EU Cost	68,277	536,964
General supplies	3,322	6,395
Comunication expenses	10,227	19,729
Material costs	103,237	224,469
Miscellaneous expenses	-	245
Motor vehicle running expenses	185,531	205,691
Overhead expenses	3,056	520
Other running costs	-	284
Postage	59	277
RAF costs	17,438	-
Rent	7,475	16,100
Repairs and maintenances	40,015	35,257
Subcontract expenses	472,836	567,020
Travel	9,932	9,429
Wages and salaries	228,144	424,563
Total cost of operations	1,409,885	2,230,793
Balance carried forward	1,409,885	2,230,793

The above detailed statement of operations is to be read in conjunction with the disclaimer report set out on page 21.

Sugar Research Institute of Fiji
Statement of Operations
For the year ended 31 December 2010

	2010	2009
	$	$
Balance brought forward	1,409,885	2,230,793
Administrative expenses		
Accommodation and meals	25,751	31,965
Auditors remuneration - audit	8,500	8,500
- other services	3,561	4,172
Board fees	36,750	31,480
Board allowances	-	832
Business licenses	216	310
CEO Donation	200	-
CEO Security	4,410	-
Consultanties	7,508	-
Electricity	4,048	3,271
Fees- Science Audit Committee	1,000	2,000
Fiji National Provident Fund contributions	50,054	58,111
FSC costs	1,392,913	208,134
General expenses	1,314	12,552
Hire of services	17,204	23,498
ICT consumables	7,193	5,404
ICT license	8,586	8,345
Communication expenses	16,368	18,277
Insurance	46,355	57,064
Legal fees	10,786	11,311
Medical expense	14,958	8,055
Media and publication	7,619	572
Freight	15,178	10,267
Rent	27,490	29,603
Repairs and maintenance	16,667	34,304
Stationery	7,067	9,678
Subscriptions	8,466	2,842
Training	-	1,340
Balance carried forward	1,740,162	581,887

The above detailed statement of operations is to be read in conjunction with the disclaimer report set out on page 21.

Sugar Research Institute of Fiji
Statement of Operations
For the year ended 31 December 2010

	2010 $	2009 $
Balance brought forward	1,740,162	581,887
Training and Productivity Authority of Fiji	4,897	6,206
Travel	31,566	61,990
Tuition fees	-	4,838
VAT penalty	102,528	-
Visa permit	1,902	1,145
Water	12,413	13,467
Wages and salaries	261,238	189,814
Total administrative expense	2,154,706	859,347
Total expenditure	3,564,591	3,090,140
Surplus for the year	**49,560**	**-**

The above detailed statement of operations is to be read in conjunction with the disclaimer report set out on page 21.

Staff listing 2010

Name	Designation	Name	Designation
Jai Gawander	Chief Executive Officer	Mosese Turaga	Rouger
Sanjay Namal Prakash	Finance & Admin Manager	Naleen Krishna	Lab Assistant
Amit Raj Singh	Scientific Officer	Permal Samy	Rouger
Andreen Astika Kiran	Technical Assistant/Grower Services	Pushp Chand	Research Hand
Desmond Vinod Kumar	Technical Officer/Grower Services	Rahimat Ali	Rouger
Doreen Ram	Senior Technical Assistant/Grower Services	Raj Kumar	MV Driver
Jainesh Anish Ram	Junior Technical Officer/Grower Services	Raj Kumar D	Field Worker
Karuna Garan	Technical Officer	Raja Ram	Rouger
Maciu Talebulamaimaleya	TFO Clerk	Rajendra Prasad	Rouger
Muni Sangeeta Goundar	Senior Technical Assistant	Ram Kumar R.S	Security
Nalini Shartika Prasad	Senior Technical Assistant/Grower Services	Ramesh Chand	Head Rouger
Nemani Soli Sugubati	Technical Officer/Grower Services	Rohil Dutt Ram	Rouger
Nitika Natasha Pravashni	Corporate Assistant	Salendra Naidu	Rouger
Pedro Rounds	Scientific Officer	Sanmogam Gounder	Field Worker
Prema Nadan Naidu	Research Officer	Sat Narayan Samy	Ground Attendent
Rajendra Krishna	Technical Officer	Satendra Singh	Head Rouger
Renil Ritesh Kumar	Senior Technical Assistant/Grower Services	Semesa Narara	Rouger
Ronal Rajnil Kumar	Junior Corporate Officer	Serevi Nauvi	Rouger
Sada Sivan Swamy	Technical Officer/Grower Services	Shiu Nadan	Security
Saimone Sabakera Johnson	Senior Scientific Officer	Solomoni Tusasa	Field Worker
Samuel Dyer Work	Junior Technical Officer/Grower Services	Subhas Chand	Head Rouger
Sanmogam Gounder	Senior Technical Assistant/Grower Services	Subram Naidu	General Hand
Shireen Shabrina Sattar	Senior Technical Assistant/Grower Services	Surendra Kumar	Rouger
Jasneel Jay Singh	Senior Technical Assistant/GIS	Suresh Mani	MV Driver
Ajay Anand Prasad	Field Worker	Surindar Singh	Rouger
Aporosa Rasavulu	Security	Suruj Kumar.	Estate Sirdar/Headman
Ashok Kumar	Field Worker	Tarun Sami	Security
Ashwin Prasad	Rouger	Vijay Datt	Rouger
Aven Lal	Field Worker	Vijay Nand Sharma	Head Rouger
Avinesh Kumar	Rouger	Kailas Kumar H.	Field Worker
Baskaran Pillay	Field Worker	Kamal Nabi	Estate Driver
Chandra Segra Pillay	Rouger	Krishan Chandra	Rouger
Dhirendra Chand Rao	Field Worker	Lachman	Field Worker
Dinesh Dutt	Rouger	Log Nadan	Head Rouger
Ilimeleki Katuba	Field Worker	Madho	Esate Driver
Jai Ram Mudliar	Office Attendent/Driver	Manoj Datt	Rouger
Jonetani Talemaitoga	Field Worker