SUGAR RESEARCH INSTITUTE OF FIJI

ANNUAL REPORT 2008

MISSION STATEMENT

Advancing Industry by Excellence in Research

to Improve Productivity

Chairman's Report

The Sugar Research Institute of Fiji was constituted under an Act of Parliament in 2005, and officially founded on the First of October 2006. Under the Act, the Institute is financed equally by the Government of Fiji, the Fiji Sugar Corporation and the Sugar Cane Grower's Council.

The Board members, appointed by the Government, assembled in Lautoka for their first meeting on November 15th 2006. At this meeting the procedural matters necessary for the operation of an organization such as this were set out, and applications called for the position of Chief Executive Officer. Due to an unfortunate set of circumstances completely outside the control of the Board, the appointment was not able to be finalized, and a further round of applications was called. A CEO was appointed towards the end of 2007, and the successful applicant took up his position in early 2008.

The Institute made its temporary headquarters in the buildings formerly occupied by FSC's Sugar Cane Research Centre, shortly afterwards establishing branch offices in the three mill areas of Viti Levu and in Labasa on Vanua Levu. A permanent headquarters for the Institute is yet to be established.

The objectives of the Institute are wide ranging, and include, among others:-

- To design, develop, monitor and review research programmes and research strategies for the sugar industry;
- To carry out research into any matters relating to the sugar industry;
- To prevent, control and eradicate pest infection of sugar cane;
- To develop a cane quality payment system for the sugar industry;
- To provide training, advice and information to any person concerning any matter relating to the production, harvesting and processing of sugar cane or any other matter relating to the production of sugar cane or sugar cane by-products;
- To monitor and improve the quality of sugar cane, cane and sugar by-products;
- To preserve and enhance the ability of land to sustain sugar crops;
- To assist in keeping to a minimum the damage to the environment that may be caused by the activities of the sugar industry;
- To identify diversification opportunities for the sugar industry;
- To carry out field and factory audits to assess performance trends for the benefit of the sugar industry.

Staff are being recruited and trained, as finances permit, under the guidance of the well trained staff brought over from the Sugar Cane Research Centre, and the functions set out in the objectives are being carried out as the opportunity permits. Details of the Institute's operations for the year 2008 are set out in the report which follows. The Institute welcomes interaction from inside or outside the sugar industry, and the CEO and his staff will be happy to answer queries or provide further information on any aspect of this report or the Institute's activities.

P.G. Atherton OAM, CPEng
Chairman, Sugar Research Institute of Fiji

CEO's Report

In late 2007 the Board appointed the Chief Executive Officer of the Sugar Research Institute of Fiji who took up the position in March 2008. This provided the Institute an opportunity to assess the internal structures and to streamline the operation of the Institute. It was decided that the Institute develop a corporate plan that not only focused on the sugar industry but also the whole agricultural sector.

That is the focus would be to provide a total solution system to the cane growers and the millers over a period of time. Thus empowered with the new structure and corporate plan a suitable staff performance evaluations system was developed that was transparent with more objective evaluation criteria based on competency models measuring better individual skills and performances.

The year 2008 will be remembered for extremely high fertilizer prices internationally, the decline in Protocol Sugar Price by 9.2% in 2008, release of fund from European Union for the Institute, research audit by Bureau of Sugar Experimentation Station Limited, Australia, and commencement of Technology Transfer and Meet Individual Grower Meetings, approval to set up the Disease Control and Productivity Unit and developing sustainable production systems. The high prices of fertilizer because of tightening of supplies continued throughout the year. However, this did not have a major impact on cane growers in Fiji in view of the price control on fertilizers.

The need to strengthen technology transfer was the single most important aspect of the 2008 activities particularly in view of the fact that the Extension Officers were based with Fiji Sugar Corporation Ltd. The senior staff agreed with management on the need for taking technology to the growers. The only avenue for this to be achieved was to reduce research activities by approximately 30% of research staff utilizing this time for conducting extension activities.

The initial surveys conducted by staff in all sectors prior to "Meet the Grower Meetings" clearly indicated that 47% growers felt that late delivery of fertilizer was the major constraint followed by weed control and drainage, harvesting and transportation were the other main issues for most growers. A total of 28 technology transfer meetings were organized with focus on various aspects of sugarcane production. These were very popular with the growers and on an average 30-40 growers attended these meetings. It was very clear from these activities that there is a great need for information by growers for better management systems to improve yields.

The weather was not conducive for planting and replanting of cane during the year. It is apparent that weather now has a major impact on various operations needed to produce good cane. The small windows of opportunities that are normally available to growers in Fiji for various agricultural activities appear to be diminishing over the last two seasons due to various extreme weather events. Thus weather had a major impact on cane planting during the year and as a result there was low planting in spite of the fact that European Union provided funding under the National Adaptation Strategy. These weather effects, if extrapolated, should be of concern to all and direct the sugar industry to ask the question what could be the impact on sugar industry due to Climate Change and possible sea level rise.

The plant breeding projects had mixed fortunes during the year due to low production in terms of seedling production from the number of crosses made. This poor seedling germination warranted an

external support from breeding expert to resolve this issue the following year. It was agreed that one of expert scientist on breeding from the Board would be requested to support the crossing and fuzz germination in 2009. A successful Large Mill Testing of the promising variety at Rarawai Mill was highlight breeding achievements besides routine advancement of varieties. It was agreed despite some reluctance to plant advanced varieties as large strip trials at one location rather than at four locations in small randomized trials. This trial would be carefully monitored to see the outcome of this preliminary experiment to decrease the intergeneration time of varieties.

In order to meet the goals of the Institute plans were approved for the Productivity Unit of Sugar Research Institute of Fiji. This unit was to take up the fundamental roles of extension, rouging and seedcane production, a unique opportunity for the Fijian sugar industry.

Fiji disease and borer damage continue to be the main pest and disease issues facing the growers. The situation is a little precarious in view of stand over cane being severely affected with Fiji disease. This is an area of major concern. The EU provided funding for Hot Water Treatments Plants in view of the fact that there was widespread infection of Ratoon Stunting Disease in the Fijian sugar industry.

Approval was given to set up Geographical Information System and to collaborate with our international partners Land Care, New Zealand.

The Institute suffered two major setbacks due to reasons beyond its control. Firstly, the mill audit could not be conducted due to the delay in obtaining information from FSC Ltd. Secondly the disease control and productivity unit was not set up as the Corporation had plans to reverse its earlier decision on estates and government had plans to revert extension back to FSC Ltd.

It was agreed by the Board and Management that for the Institute to be successful within the next five years in the currently rapidly changing world, we need to maxmise the productivity of our resources like physical, financial, information and human. For the Institute, the positions at the Institute will never be of the past as we cannot live in the past. To achieve progress we needed to recruit more staff and develop capacity. Changes are based on changing technology, our changing work force and on changing nature of work itself. The changes are different this time that is it is more permanent. The Institute will provide opportunities to learn skills and develop new abilities, to respond to these changes in our careers and our Institute. It is hoped that this process will allow everyone to acquire skills, knowledge and abilities to perform on their positions. This will help us of the goal to improve the performance of the Institute by increasing the efficiency and performance of our stakeholders in few years time.

Jai Gawander

RESEARCH & DEVELOPMENT

Crop Improvement

This section is responsible for breeding improved varieties of sugarcane for the Fiji Sugar Industry. The table below summarizes the number of clones of the different series and the respective stages.

Stage / Series	I	II	III	IV	V
LF97	30918	1795	132	28	**6**
LF98	9012	1388	205	32	**7**
LF99	32000	2582	291	60	**7**
LF00	14346	1203	240	127	**11**
LF01	13791	497	154	27	
LF02	21419	1209	128	46	
LF03	23420	1429	113	25	
LF04	15070	967	62	39	
LF05	25118	1610	149	11	
LF06	11555	606	86		
LF07	10784	706			
LF08	**10527**				

Flowering Beds

There were six flowering beds that produced flowers for crossing in 2008. The number of varieties in the "Arrowing" beds for the 2008 crossing season was 605.

Crossing

The 2008 crossing season commenced on 28th April and ended on 18th July. A total of 453 bi-parental crosses were set-up using 167 female and 152 male parents. All the flowers that were used in crossing were obtained from the flowering beds at Dobuilevu.

Fuzz Sowing and Raising Seedlings

Fuzz sowing commenced on 11th July and ended on 15th August 2007. A total of 546 packets of fuzz was sown that included fuzz from the past five years. 147 packets germinated (27 %) and produced 12485 seedlings.

Stage 1 Trial Planting

A total of 10527 varieties, from the LF2008 series, which was 92% of the total potted (11450) were transplanted to an area of 1.2 hectare as single stools. The seedlings were irrigated and established well.

Stage 1 Trial Selection

A total of 706 cultivars of LF 2007 series were advanced from stage 1 single stool clones to stage 2 single lines. The selection percentage was 6.5% of the 10784 clones from stage 1. The selection was done nine months after planting and was based on brix, vigour and disease incidence.

Table 1: Brix range for selected varieties and standards

Brix	≥25	≤25	≤24	≤23	≤ 22	Total
Varieties Selected	94	192	281	106	33	706

Stage 2 Trial (LF2006 series)

Preliminary selection (via brix readings) was carried out at the end of July and the cane analysis completed in August. The final selection of varieties was based on comparison of data of test clones against standards. The varieties were selected on sucrose content and % fibre. Based on the selection criteria above 86 varieties were selected and advanced to stage 3 observation plot trial. The sucrose content of the selected varieties ranged between 102 – 16.1 %. The fibre content of the selected varieties ranged between 7.3 – 15.0%.

Stage 3 Trial (LF2005 series)

The cane analysis was conducted in August 2008. The final selection of varieties based on both comparison of test clones data against the standards and field information was recorded during sampling. Eleven varieties were selected on sucrose content and % fibre and advanced to stage 4 seed bed. The sucrose content of the

selected varieties ranged between 11.1 – 16.7 % and the standards from 13.4 – 14.0%.

Development of high fibre varieties

The high fibre (HF) varieties identified from progressive stage 3 and 4 trials were not advanced further in the programme due to their profuse early flowering except one variety LF02-541 that will be further evaluated. The large plot trial of the high fibre variety, LF97-382 was planted in 2008 and the large mill trial for this variety will be conducted in 2009. There were six flowering beds that produced flowers for crossing in 2007. The number of varieties in the "Arrowing" beds for the 2007 crossing season was 685.

Stage 4 Trials

The following series were analysed for the stage 4 trial; LF01 (2nd ratoon), LF02 (1st ratoon) and LF03 (plant). The tables below show the summarized data of selected varieties for advancement from all trial locations.

Table 2: LF01 Summary

Variety	%pocs	%fibre	tc/ha	ts/ha
LF01-409	15.7	9.0	128	19.4
LF01-480	16.8	13.6	107	17.3
Naidiri	15.1	10.6	122	17.8
Aiwa	16.8	9.1	107	17.3
Ragnar	14.3	9.0	97	12.8

Table 3: LF02 Summary

Variety	%pocs	%fibre	tc/ha	ts/ha
LF02-144	15.7	10.9	84	13.1
LF02-541	14.7	10.3	128	18.6
LF02-158	14.3	13.2	125	17.9
Aiwa	14.4	10.6	118	16.6
Mana	13.8	8.9	124	16.8
Naidiri	14.8	10.9	106	15.2

LF01-409 & LF01-480 have been marked for advancement to stage 5.

Varieties LF02-144, LF02-541 and LF02-158 have been marked for further analysis in the first ratoon crop before further advancement.

Varieties from the LF03 series will be selected after the first ratoon evaluation.

Stage 5 Trials

The following series were analysed for stage 5 trial; LF01 (plant), LF00 & LF99 (ratoon). Varieties selected from this stage would be further evaluated in the large mill trial.

Table 4: LF01 series

Variety	% pocs	% fibre	tc/ha	ts/ha
LF01-30	15.6	10.4	90	13
LF01-480	15.5	13.0	98	15.9
Aiwa	16.3	10.6	98	15.9
Naidiri	15.4	10.4	116	16.0
Ragnar	15.4	10.4	116	15.5

All selected elite varieties from stage 4 and stage 5 will be planted in a strip trial for large scale research.

Table 5: LF00 series

Variety	%pocs	%fibre	tc/ha	ts/ha
LF00-431	15.7	11.9	105	16.1
LF00-1057	15.6	11.1	121	18.5
Mana	15.2	8.7	88	13.3
Naidiri	16.2	10.2	106	17.0

Large Mill Trial – LF94-694 Seed Propagation

Seed material of promising variety LF94-694 was propagated during the year. The actual trial will be planted in 2009.

New Variety – LF82-2244

The new variety LF82-2244 is due to be released in 2009.

Analytical Laboratory

1. Introduction

The Analytical Laboratory continues to provide essential analytical services to growers and other research work where soil and leaf samples are mostly analyzed for blended fertilizer recommendations. Cane samples are mainly analyzed to determine %pocs and % fibre for research trials conducted by the respective sections in the four mill areas.

The laboratory carries out non-routine analysis such as soil salinity & sodicity assessment, cation exchange capacity, soil texture, organic matter, total nitrogen & phosphorus, micronutrients analysis and cane deterioration analysis upon request, while few soil samples were analyzed for commercial purposes in year 2008.

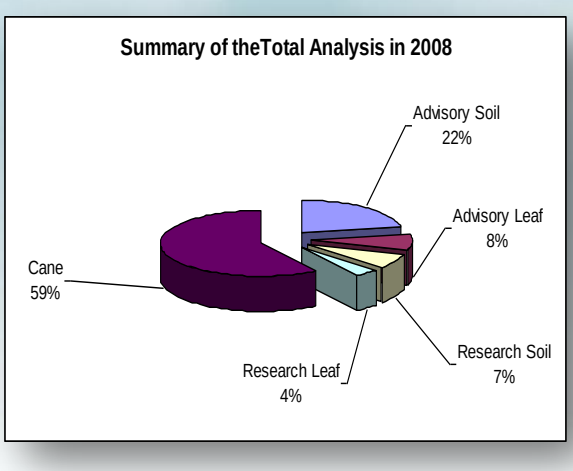
2. Soil and Leaf Samples

A total of 1695 soil and leaf were analyzed for advisory and research purposes. Out of which 1245 samples were for Fertilizer Advisory Services (FAS) for plant and ratoon crop recommendation. Only a small proportion of cane farmers in Fiji use FAS.

Hence an educational program on soil sampling was conducted in 37 sectors through technology transfer meetings. The idea was to educate farmers so that they carry out soil sampling themselves.

A similar training is required on leaf sampling so that farmers can carry out sampling on time and apply fertilizer to their successive ratoon crop accordingly as per fertilizer recommendation based on leaf analysis.

A new UV/Visible spectrophotometer *Varian Cary 50* was purchased to carry on with soil and leaf analysis. The laboratory is planning to upgrade its instruments depending on availability of funds in the near future.



Development of soil-specific guidelines for nutrient management is an area that the laboratory is planning to venture into.

The current analysis and experimental data on which the recommendations are based on, needs to be reviewed and analysis such as nitrogen mineralization potential of different soil types, phosphorus absorption index, other nutrients and soil physical properties will to be incorporated into the Fertilizer Advisory System.

3. Cane samples

A total of 2451 cane samples were analyzed for brix, pol, and fibre to determine %pocs in the small mill. The cane samples consist of variety, extension and agronomy trials conducted in the four mill areas (Lautoka, Labasa, Rarawai & Penang) during the year.

Currently the feasibility of using *Spectracane* for cane analysis is been looked into since the current small mill analysis is bit tedious.

4. Quality Assurance System

Our internal quality control program is well established due to the current set up of quality assurance program with other members of the South Pacific Agricultural Laboratory Network (SPACNET) for accreditation of our laboratory to international standards.

The Laboratory Technicians are provided training as part of SPACNET training program to improve the analytical skills. Safety measures regarding OHS regulations implemented in the Analytical Laboratory and Small Mill are maintained.

The membership to the Australasian Soil and Plant Analysis Council (ASPAC) exchange sample proficiency was reviewed under SPACNET funding this year. The Analytical laboratory is certified to carry out soil analysis for the following analysis: Ca, Mg, K, Na, %OM and % N while %Mg for leaf analysis by ASPAC under the 2nd round of inter laboratory proficiency program.

The Analytical Laboratory took part in the Joint Soils Conference organized by Australian and New Zealand Societies of Soil Science, which was held at Massey University, Palmerston North, New Zealand, from 1st to 5th December 2008.

Figure 1: Crushing sugarcane samples

Figure 2: Mixing shredded cane samples (fibre)

Figure 3: Extraction of sugarcane juice

Figure 4: Analysing extracted cane juice

Metrology

Introduction

The Meteorology Station in Sugar Research Institute of Fiji (SRIF) is maintained with the help of the Fiji Meteorology Services (FMS). The climate readings such as hours of sunshine, evaporation, relative humidity, air and earth temperature, wind force and rainfall are taken daily at 9.00 a.m.

The data is compiled at the end of the month and forwarded to FMS for their records. Similarly rainfall figures from the sectors in the eight districts are compiled and also forwarded to Fiji Meteorology Services. The climatic data is used to produce monthly climate summary and climate outlook for the country and a specialized quarterly climate outlook for sugarcane belt areas is also produced.

Rainfall

The enhanced rainfall associated with La Nina event and tropical cyclones *Funa* and *Gene* brought significant rain resulting in average to well above average rainfall across the country in January. *Cyclone Gene* affected almost the whole Fiji Group with damaging gale force winds and heavy rain that resulted in widespread flooding.

Two significant wet spells affected the country in February. The first spell was associated with Tropical Cyclone (TC) *Gene*, moving further away from the country during the first week. The other was associated with the merging of the South Pacific Convergence Zone (SPCZ) and a frontal system approaching Fiji during the last week of the month. The two systems brought a substantial amount of rainfall to many parts of the country in northwestern Viti Levu which resulted in severe flooding around Nadi and Rakiraki.

Rainfall in March ranged from well below average to average. March was drier than expected due to the dominant effect of a ridge of high pressure over the Fiji Group. Consequently rainfall was below average especially in southeastern Viti Levu and the eastern parts of the Northern Division. Only Sigatoka and Ba area recorded normal rainfall. Weather conditions in April were typical of a transition month. Rainfall in April was below average in parts of the country, ranging from below average to above average across the country.

A mixed weather pattern existed in May. While the month started with a wet condition, transition to more settled weather conditions took place during the later part of the month as the sub-tropical ridge of high pressure became more dominant. The country experienced the first cool spell from May 22 to 29 with several sites recording below 18°C during this period. May was considerably wetter than normal with generally above average rainfall recorded across the country.

In June, an enhanced South Pacific Convergence Zone, frontal system and trough of low pressure caused widespread rainfall with some heavy falls at the beginning and middle of the month. Most of the country received above average rainfall in June as more than usual rain-bearing systems affected the Group. Rainfall varied from below average in Nadi and Ba to well above average in the Northern Division.

In July, most parts of the country experienced drier conditions compared to long term average (1971-2000). In contrast, parts of Fiji received significant rainfall. Above average to well above average rainfall was experienced at Lautoka, Nadi Airport and Rarawai Mill while well below average rainfall was recorded in Rakiraki and Labasa.

Considerably drier than normal conditions were experienced in most parts of the country in August as stable weather conditions associated with ridges of high pressure had a more dominant (than usual) effect on the country.

Overall, August rainfall was well below average to below average across most of the Western, and Northern Divisions. Rainfall varied considerably across the Fiji Islands in September. In the Western Division, and Labasa, rainfall was below average. October was a typical transition month from Dry to Wet Season, rainfall recorded was below average across the Northern Division, and parts of the Western Division.

Due to this very significant deficiency in rainfall in August, a meteorological drought warning was in place for the Nadi, Ba and greater parts of Labasa and Rakiraki and Sigatoka Valley region from September. The meteorological drought continued to exists in parts of Western Viti Levu and Northern part of the country till October.

November showed a typical wet weather pattern confirming the timely transition into the wet season. November was wetter than normal in the Western Divisions. At Ba, and Penang, rainfall was more than twice the November long term average. In the Northern Division rainfall was average. Several rare meteorological events were reported during the month. This included hail, lightning strike and a 15 minute mini-tornado. The meteorological drought that existed in parts of Viti Levu in recent months has ended. Normal conditions exist as of December.

Rainfall varied from below average to above average across the country in December. Isolated heavy rainfall was experienced. Observed rainfall was below average in the Western Division and above average in most parts of the Northern Division.

All the four mills recorded above average rainfall for the year 2008. The rainfall received was slightly distributed throughout the year except for the dry period that prevailed from August till October mainly.

El Niño Southern Oscillation (ENSO)

The La Niña event which began in August 2007 continued to affect the Fiji Group and meteorological observations showed that the event was in a mature stage during Jan-Feb 2008. The event showed the first signs of weakening in the Pacific basin during March and continued to weaken during April.

In May, it dissipated and the Pacific climate patterns were generally neutral although some aspects of the La Niña continue to persist. El Niño Southern Oscillation (ENSO) indicators showed that neutral conditions were firmly established in the tropical Pacific in June and neutral ENSO conditions continued to prevail across the tropical Pacific till August.

Although sea surface temperatures in the tropical Pacific cooled slightly over the last three weeks in September, the ENSO state remained neutral and neutral ENSO conditions prevailed in the Pacific Basin till November. The climatic conditions and the latest model predictions forecasted a shift from neutral towards La Nina conditions in December.

Relative Humidity

Generally average to above average humid conditions prevailed in the month of January and February. Similar conditions prevailed most parts of the country during this two months.

Near average to below average humidity conditions prevailed from March to December. The relative humidity measured during this period was mainly 5 units less than the long time mean values for the respective month. The lowest monthly average was recorded for the month of September.

Sunshine

The mean sunshine hours varied during the first half of the year. The South Pacific Convergence Zone moved closer to the Fiji Group due to the

La Nina event during this period as a result mostly cloudy conditions prevailed. Monthly mean sunshine hours were above average its long time mean value from July till December.

Earth Temperature

The earth temperatures were slightly higher than the long time mean values throughout the year at all depths (5cm, 10cm & 20cm) except for the month of February and July. The earth temperature varied on day to day basis but there was an overall increase by 0.3 – 1.9ºC at all depths for respective month.

Soil Moisture

The soil moisture status was significantly better during January till March, May and November as there was sufficient moisture for moderate to good cane growth. The rest of the months, the soil moisture status was dry-limiting while drought like conditions prevailed from August till September.

The moisture status varied at different sites and during respective month but overall similar soil moisture status existed near all the four mills as well as the sectors throughout the year.

Air Temperature

The monthly mean maximum temperature and minimum temperature was mostly average to above average throughout the year across the country.

Evaporation

The raised and sunken pan evaporation varied during the year. It was mostly average to above average during the dry period "May to October".

Figure 1: Pluviometer - measures time and intensity of rainfall

Figure 2: Anatomy of a Pluviometer

Figure 3: Newly installed automatic weather station

Table 1: Rainfall (mm) for all mills - 2008

Mills	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Lautoka Mill													
Monthly Rainfall	672.2	553.5	231.8	117.8	225.9	112.3	121.8	1.1	26.4	103.3	216.2	119.3	**2501.6**
No. of rain days	24	23	21	14	13	7	3	4	6	11	13	15	**154**
99 years average	298.4	319.6	313.0	182.3	98.5	65.1	50.2	69.8	69.8	89.8	124.0	189.0	**1869.6**
% of average	225.3	173.2	74.1	64.6	229.3	172.5	242.5	1.6	37.8	115.1	174.3	63.1	**133.8**
Rarawai Mill													
Monthly Rainfall	826.5	604.6	372.4	270.9	173.2	54.7	52.1	9.2	20.7	80.9	402.0	185.0	**3052.2**
No. of rain days	22	24	19	14	15	12	3	4	6	7	17	16	**159**
122 years average	351.3	357.3	361.3	295.8	77.8	35.8	28.0	99.2	102.6	146.5	223.4	239.0	**2317.9**
% of average	235.3	169.2	103.1	91.6	222.7	152.9	186.4	9.3	20.2	55.2	180.0	77.4	**131.7**
Penang Mill													
Monthly Rainfall	1240.5	570.0	200.0	218.6	271.0	104.4	18.5	74.6	38.3	21.0	381.4	242.3	**3380.6**
No. of rain days	26	19	16	25	12	11	3	8	12	8	18	22	**180**
110 years average	432.6	351.0	410.5	387.6	121.8	68.9	51.7	93.2	84.6	145.5	153.7	238.3	**2539.3**
% of average	286.7	162.4	48.7	56.4	222.6	151.6	35.8	80.0	45.3	14.4	248.2	101.7	**133.1**
Labasa Mill													
Monthly Rainfall	1002.6	332.6	305.0	255.8	243.5	97.2	9.7	2.6	45.4	46.5	167.9	298.6	**2807.4**
No. of rain days	26	24	19	20	17	10	8	3	9	5	21	23	**185**
118 years average	365.9	358.9	378.4	238.1	110.2	64.8	46.7	50.0	101.7	100.9	203.3	252.1	**2271.1**
% of average	274.0	92.7	80.6	107.4	220.9	150.0	20.8	5.2	44.6	46.1	82.6	118.4	**123.6**

Table 2: Transeau Ratio (Precipitation/Evaporation) and Moisture Status of Soil 2008

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

Table 3: Rainfall data (mm) for Lautoka, Nadi and Sigatoka Districts 2008

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Lautoka District													
Drasa	845.0	549.6	283.4	201.2	235.4	61.4	80.0	0.0	14.8	53.0	146.1	248.2	**2718.1**
No. of rain days	18	14	13	8	11	4	2	0	3	4	6	9	**92**
Lovu	815.0	580.0	320.6	185.5	234.8	112.0	59.0	9.0	17.0	51.0	190.0	219.2	**2793.1**
No. of rain days	17	14	13	11	14	4	2	4	3	4	9	9	**104**
Saweni	729.0	551.6	245.0	240.0	223.0	73.6	89.2	2.4	17.0	65.8	131.4	260.4	**2628.4**
No. of rain days	19	16	10	10	14	6	2	1	3	3	9	9	**102**
Natova	694.6	662.0	297.8	206.8	210.2	77.2	93.4	15.8	18.8	72.4	114.0	267.2	**2730.2**
No. of rain days	19	15	10	10	11	7	2	2	4	4	6	9	**99**
Nadi District													
Legalega	410.2	533.9	330.0	298.4	220.0	100.0	120.0	0.0	25.1	140.0	148.0	162.5	**2488.1**
No. of rain days	17	16	12	9	9	5	2	0	3	3	6	6	**88**
Meigunyah	511.0	517.2	294.2	210.0	204.0	67.0	70.4	0.0	23.1	100.0	132.0	163.2	**2292.1**
No. of rain days	18	16	10	8	8	5	2	0	4	3	6	6	**86**
Qeleloa	559.4	410.4	376.8	227.0	259.2	104.4	102.0	0.0	23.0	110.0	226.0	77.0	**2475.2**
No. of rain days	19	16	11	9	9	5	2	0	4	3	6	6	**90**
Navo Dist/Office	607.2	760.1	450.9	390.0	250.9	109.5	90.0	0.0	52.9	134.9	316.9	96.0	**3259.3**
No. of rain days	19	15	12	12	13	7	2	0	4	4	7	6	**101**
Malolo	720.5	529.0	383.2	163.4	248.4	103.5	53.4	0.0	73.2	174.0	184.6	80.6	**2713.8**
No. of rain days	18	16	8	8	10	5	2	0	4	4	6	4	**85**
Nawaicoba	816.4	531.0	442.2	145.5	208.8	123.4	86.2	0.0	73.4	203.0	225.5	96.0	**2951.4**
No. of rain days	19	18	13	8	9	6	2	0	3	3	9	5	**95**
Yako	569.0	424.0	294.0	206.0	199.0	175.0	56.0	0.0	67.0	133.0	159.0	93.5	**2375.5**
No. of rain days	16	14	11	5	7	4	2	0	3	3	4	5	**74**
Sigatoka District													
Natadola (Farm)	*	*	*	*	*	*	*	*	*	*	*	*	**0.0**
No. of rain days	*	*	*	*	*	*	*	*	*	*	*	*	**0**
Lomawai	817.0	276.0	264.5	145.0	86.0	146.5	48.5	12.0	74.0	84.5	144.0	140.0	**2238.0**
No. of rain days	15	12	10	8	9	8	3	2	3	5	8	7	**90**
Cuvu	561.5	327.5	288.0	121.5	204.0	161.0	73.0	51.0	69.0	149.0	243.0	131.5	**2380.0**
No. of rain days	14	15	10	9	9	11	5	5	4	4	7	6	**99**
Olosara	501.0	285.9	273.5	99.5	248.2	143.7	55.0	45.0	57.5	112.0	158.3	119.0	**2098.6**
No. of rain days	16	12	9	8	11	10	3	5	4	4	8	6	**96**

NB: No rainfall data was available for Natadola this year.

Table 4: Rainfall data (mm) for Rarawai Mill 2008

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Rarawai District													
Varoko (Sarava)	982.0	607.0	317.0	173.0	189.0	38.0	49.0	1.0	7.0	39.0	396.0	211.0	**3009.0**
No. of rain days	17	13	8	7	10	4	2	1	2	4	8	8	**84**
Mota	1099.0	728.0	415.0	285.0	289.0	76.0	37.0	2.0	7.0	85.0	303.0	267.0	**3593.0**
No. of rain days	20	16	10	8	12	9	2	1	1	5	8	8	**100**
Naloto (Nukuloa)	1098.0	1068.0	409.0	326.0	340.0	124.0	50.0	15.0	15.0	94.0	215.0	239.0	**3993.0**
No. of rain days	21	17	8	7	11	8	2	1	2	5	7	9	**98**
Rarawai	932.9	575.2	345.5	278.9	187.5	51.8	44.9	7.4	7.5	80.5	389.5	165.8	**3067.4**
No. of rain days	21	17	9	7	11	6	2	1	2	5	9	8	**98**
AES - Rarawai	826.5	604.6	372.4	270.9	173.2	54.7	52.1	9.2	20.7	80.9	402.0	185.0	**3052.2**
No. of rain days	22	24	19	14	15	12	3	4	6	7	17	16	**159**
Koronubu	807.0	702.0	217.3	228.0	217.0	54.0	49.0	23.0	3.0	89.0	290.0	314.0	**2993.3**
No. of rain days	18	16	7	8	11	6	2	1	2	5	9	9	**94**
Veisaru (Navatu)	804.0	519.0	259.0	192.0	129.0	45.0	54.0	17.0	11.0	37.0	272.0	99.0	**2438.0**
No. of rain days	18	12	7	7	11	5	2	1	2	3	8	8	**84**
Varavu	764.0	474.0	285.0	140.0	152.0	28.0	27.0	0.0	1.0	12.0	206.0	128.0	**2217.0**
No. of rain days	17	12	7	6	9	5	2	0	1	3	7	7	**76**
Tavua District													
Tagi Tagi	762.0	480.0	355.0	283.0	239.0	85.0	33.0	0.0	2.0	45.0	282.0	189.0	**2755.0**
No. of rain days	16	11	7	8	10	4	1	0	1	3	6	6	**73**
Yaladro (Tavua)	892.0	510.0	230.0	347.0	198.0	88.0	21.0	0.0	4.0	41.0	271.0	70.0	**2672.0**
No. of rain days	18	12	8	7	11	5	1	0	1	5	6	6	**80**
Drumasi	760.0	451.0	245.0	290.0	248.0	56.0	21.0	0.0	4.0	50.0	272.0	145.0	**2542.0**
No. of rain days	19	15	11	7	11	4	1	0	1	3	7	5	**84**

Table 5: Rainfall data (mm) for Penang Mill – 2008

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Nanuku	733.2	448.4	181.8	84.6	160.6	57.2	17.8	0.0	0.0	0.0	229.0	60.8	**1973.4**
No. of rain days	14	10	7	5	8	3	1	0	0	0	5	3	**56**
(Malau) Penang Mill	1240.5	570.0	200.0	218.6	271.0	104.4	18.5	74.6	38.3	21.0	381.4	242.3	**3380.6**
No. of rain days	26	19	17	24	12	11	3	8	12	8	18	22	**180**
Ellington I	427.1	245.1	*	152.0	165.3	73.4	28.1	13.0	10	21.1	157.7	141.8	**1434.6**
No. of rain days	21	11	*	14	16	9	3	4	1	4	13	11	**107**
Ellington II	469.0	234.2	133.7	208.1	195.9	145.2	254.4	3.0	42.7	70.2	203.6	631.9	**2591.9**
No. of rain days	13	15	11	12	14	9	4	3	7	9	11	16	**124**

NB: No rainfall data was available for Ellington I for month of March.

Table 6: Rainfall (mm) data for Labasa Mill – 2008

Sector	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Seqaqa District													
Rokosalase (Solove)	813.0	292.7	193.7	152.6	126.5	119.2	16.8	11.4	16.1	126.3	150.8	145.8	**2164.9**
No. of rain days	24	22	14	13	15	11	5	5	4	9	16	13	**151**
Naravuka (Bulivou)	870.7	253.8	195.3	173.5	127.2	116.7	145.8	39.8	53.5	115.2	455.1	179.0	**2725.6**
No. of rain days	23	14	13	7	10	9	6	4	4	9	15	7	**121**
Natua (Seaqaqa)	984.4	542.0	239.8	210.3	366.2	200.8	18.3	10.0	35.5	59.6	107.0	376.6	**3150.5**
No. of rain days	28	21	20	20	21	13	5	5	10	8	15	23	**189**
Seaqaqa Sub. St.	976.6	666.4	309.5	262.8	333.3	197.8	22.2	6.8	17.4	134.0	196.8	535.4	**3659.0**
No. of rain days	23	25	13	13	20	12	6	2	3	5	17	19	**158**
Labasa District													
Waiqele	964.5	424.0	390.8	255.8	307.4	180.7	11.0	14.4	55.6	47.6	164.5	342.0	**3158.3**
No. of rain days	22	15	12	13	15	7	2	3	6	3	13	15	**126**
Wailevu	999.4	287.3	275.1	153.0	283.3	102.6	5.8	7.9	63.6	46.3	159.4	250.8	**2634.5**
No. of rain days	21	23	14	12	12	6	1	5	4	4	14	13	**129**
Vunimoli	1494.4	436.0	350.8	354.6	278.4	252.0	20.6	5.8	43.6	15.0	214.0	285.4	**3750.6**
No. of rain days	28	21	17	17	15	10	3	3	5	6	15	16	**156**
Korowiri (Labasa M)	1002.6	332.6	305.0	255.8	243.5	97.2	9.7	2.6	45.4	46.5	167.9	298.6	**2807.4**
No. of rain days	26	24	19	25	17	10	8	3	9	5	21	23	**190**
Nagigi (Bucaisau)	986.4	430.0	233.0	115.8	206.2	120.0	3.2	6.6	54.8	10.0	166.4	237.2	**2569.6**
No. of rain days	22	15	11	10	12	6	2	3	4	2	15	9	**111**
Daku	941.4	375.9	269.4	115.0	186.2	205.5	21.7	3.2	83.0	11.5	210.9	320.3	**2744.0**
No. of rain days	24	19	17	13	12	8	2	2	8	2	15	14	**136**
Kuru Kuru (Daku)	1259.6	380.8	252.2	136.9	185.7	196.9	14.0	0.0	93.6	27.2	125.1	344.6	**3016.6**
No. of rain days	27	16	17	10	11	8	2	0	6	5	13	16	**131**
Wainikoro	1138.2	538.0	335.6	121.0	203.0	251.0	21.0	4.0	86.0	10.0	146.2	258.0	**3112.0**
No. of rain days	20	18	15	13	13	8	3	1	6	3	9	10	**119**
Vunivutu (Wainikoro)	*	*	144.2	150.5	129.5	144.5	16.4	4.2	41.4	12.2	174.4	327.9	**1145.2**
No. of rain days	*	*	12	11	15	11	2	2	5	3	13	12	**86**
Papalagi (Wainikoro)	807.0	344.0	101.9	88.1	107.3	139.4	3.2	0.2	11.9	4.0	190.5	434.7	**2232.2**
No. of rain days	25	13	11	6	8	7	1	1	3	1	18	23	**117**

NB: The previous observer did not take the rainfall reading for January and February. Hence the rain gauge at Vunivutu was relocated.

Table 7: Meteorological data for Sugar Research Institute of Fiji, Lautoka – 2008

Measurements	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Relative humidity (%)												
Humidity	78	81	77	72	73	77	69	68	64	67	69	68
51 years average	76	77	80	77	79	79	74	73	70	69	73	73
Air temperature (°C)												
Mean maximum	30.3	30.4	30.6	31.2	28.8	29.5	28.6	29.8	30.3	30.7	30.5	31.5
Mean max 52 years	31.2	31.6	31.0	30.4	29.3	28.8	28.5	28.5	29.2	29.5	30.3	31.4
Mean minimum	23.5	23.6	23.3	23.1	21.5	21.3	19.5	20.7	21.3	22.2	22.6	23.7
Mean max 52 years	23.8	22.6	24.1	23.2	21.3	21.0	19.7	20.4	21.0	21.3	23.0	23.7
Mean	26.9	27.0	27.0	27.2	25.2	25.4	24.1	25.3	25.8	26.5	26.6	27.6
Highest maximum	32.0	32.7	32.6	33.6	30.9	31.5	30.2	31.5	32.9	32.9	31.9	32.8
Lowest minimum	21.0	21.0	18.9	21.2	17.8	18.7	15.5	18.6	17.9	15.9	20.7	21.7
Evaporation (mm)												
Sunken pan	107.9	61.8	119.0	135.9	96.1	92.0	103.1	134.1	149.1	157.4	168.6	145.2
Sunken pan 51 years	163.3	121.7	133.4	127.0	108.4	95.0	117.3	136.5	143.0	177.4	162.1	189.9
Raised pan	130.0	132.8	146.5	156.2	131.0	116.5	137.6	167.4	178.0	201.9	189.5	209.4
Raised pan 51 years	161.3	143.4	147.1	134.9	116.7	107.3	136.4	154.0	165.0	197.7	182.4	203.1
P:E ratio	5.17	4.17	1.58	0.75	1.72	0.96	0.89	0.01	0.15	0.51	1.14	0.57
Earth temperature (°C)												
5 cm	28.6	28.2	28.2	27.7	25.1	24.8	23.2	26.0	28.1	30.1	30.7	31.2
10 cm	28.4	27.7	28.0	27.5	25.2	24.9	23.5	26.2	27.6	29.2	29.3	30.1
20 cm	*	29.4	29.4	29.1	27.1	26.8	25.5	27.7	28.9	30.1	30.4	30.7
100 cm	23.0	22.2	23.5	23.3	22.0	21.3	20.2	21.4	22.3	23.3	23.9	24.0
51 year mean 5 cm	29.0	28.3	27.7	27.3	26.1	24.4	23.6	24.6	26.3	28.2	30.2	31.0
51 " " 10 cm	28.3	28.5	27.6	26.9	24.8	24.6	24.5	24.7	26.7	27.3	28.2	29.9
51 " " 20 cm	29.0	30.0	28.9	28.3	27.0	26.0	26.6	26.0	27.1	28.3	30.0	30.7
Sunshine (hours)												
Mean	5.1	5.4	6.1	7.3	5.3	6.6	8.1	8.5	7.3	8.0	7.7	8.1
50 years mean	6.4	6.3	6.8	7.0	5.8	8.2	7.6	7.6	7.3	8.2	6.7	7.8

NB: The earth thermometer for 20cm depth was broken in Nov 2007 and replaced in Feb 2008. Hence no temperatures readings were taken for the month of January.

Crop Protection

Crop Protection section is tasked to observe with great vigilance the possible outbreak of sugarcane diseases and its management that may affect the health of the crop or reduce the crop yield in the Fiji Sugar Industry. Our main objective is to breed for resistance to sugarcane diseases and to manage the spread of diseases in the commercial cane fields.

Diseases

There are currently three major sugarcane diseases and one major insect pest, namely Downy mildew (*Perenosclerospora sacchari* Miyake), Fiji leaf gall (formerly known as Fiji disease) disease and ratoon stunting disease (*Leifsonia xyli* subsp *xyli*). Altogether, thirty-one known sugarcane disease has been recorded in Fiji since the inception of the sugar industry in the 1880s. Of the three major diseases, downy mildew has not been recorded since 1996. Fiji leaf gall disease is currently our major disease while the insect pest, cane weevil borer (*Rhabdoscelus obscurus* Boisd.) has caused economic loss over the years.

Fiji Leaf gall disease

Fiji leaf gall disease (Fiji virus) was recorded in most of the sectors in the Lautoka mill area and a few stools infected at Rarawai mill area. The variety that is most affected is Mana and this variety is widely planted in the Viti Levu mills accounting for almost 80% of the total cane crop.

The resistance screening of the new clones (LF03 and LF04) were initiated in April/ May with the field collection of the sugarcane leaf hoppers (*Perkinsiella vitiensis*). The captured insects were placed (bred) in a cage containing an infected *Erianthus maximus* (Fiji 10) plant at our nursery. Viruliferous nymphs appeared after 4 – 5 weeks in these cages and then were released into bigger insectaries containing the entire test clones. Constant care for the clones in the field by irrigating and fertilizing the plants enabled the symptoms to stand out. The results (Table 1) of the trial showed that 67% of the LF2003 series were resistant while 33% were moderately susceptible. Only 19% of the LF2004 series were moderately susceptible while 81% were resistant.

Figure 1: Leaf Hopper on Disease Cane.

Table 1: Resistance of Clones screened for Fiji leaf gall disease

Series /Number screened	Clone Resistance (%)		
	Resistant	Moderate	Susceptible
LF2003	67% (16)	33% (8)	(0)
LF2004	81% (29)	19% (7)	(0)

Downy mildew disease

The management of downy mildew disease in commercial fields has been a success and this is attributed to planting resistant sugar cane variety and a resistant maize variety, Nirhala, an alternate crop planted in the Sigatoka valley. The Disease Control Unit has contributed also in conducting vigorous rouging in these areas. Random checks are done periodically to ascertain if recurrence of the disease.

Screening for resistance to Downy mildew disease was conducted at the downy mildew disease nursery at Tavakubu, Lautoka. Downy mildew disease (*P. sacchari*) nursery at

Tavakubu was maintained with the use of irrigation systems as rains were lower than expected. To increase the fungal inoculums (spores), continuous irrigation was done on alternate days. During the observation period, we faced heavy rain that forced us to abandon the trial due to heavy flooding which severely damage the roads and bridge leading to the trial site. The trial will be repeated in 2009.

Ratoon stunting disease

The last national survey of Ratoon stunting disease incidence in 2000 showed that a percentage incidence of 28% of all the sugar cane sectors in Fiji was infected with RSD (*Leifsonia xyli* subsp. *xyli*). The survey was conducted using phase contrast microscopy and ELISA technique known as Evaporative – binding immuno assay (EB-EIA.) RSD is a disease that can be managed successfully with the use of clean seed cane production from hot water treated seed bed. A total area of 4.7 ha of seed cane has been planted as "Mother plots" (primary) with Mana, Kaba, LF91-1925 and a near release variety. This seed cane will go into "Distribution plots" (secondary) in 2009. The instalment of a new HWT plant at Rarawai mill will enable us to continue to the clean seed cane programme to other sectors. It is expected that two more installations will be done in 2009 in other mill areas.

The screening for RSD resistance was not done in 2008 as we were getting false reading from the ELISA Micro-plate Reader. The sap from the trial is being freezed and will be analysed once the ELISA reader is repaired.

Cane weevil borer

Cane weevil borer (*Rhabdoscelus obscurus,* Boisd) is the most serious pest in Fiji's sugar industry with a 1% POCS loss of cane received at the sugar mills. Since the inception of the sugar industry, the weevil has been present and is thought to be a beetle species that came through Papua New Guinea via Hawaii during the movement of sugar cane material from one country to the other. Field surveys show that Mana in the Viti Levu mills is most affected while Waya is most affected in Labasa mill. From the experiment conducted, LF02-458, LF02-149 was the most affected similar to Mana and Kaba while the rest were unaffected (Table 2). It can be deduced from this that the test clone that had the least tunnel length damaged by the cane weevil borer was the least preferred by the insect pest.

Table 2: CWB trial results

Variety	Length dam.(cm)	No. of Larvae	Weight of larvae (g)
LF02-458	15	1	0.03
LF02-149	15	1	0.02
Ragnar	0	0	0
Mana	16	2	0.05
Kaba	16	2	0.03
Waya	0	0	0
Homer	0	0	0
Naidiri	0	0	0

Figure 2: Cane weevil exit hole.

Disease Control

The priority of the Disease Control Unit remained as that of previous years with emphasis on inspection of farms with a history of Fiji leaf gall (FLG) disease incidence as this disease was spreading. Disease Control for all the four sugar mills continued with vigor, especially on farms with a history of diseases

and also farms with plant cane. The inspection of farms with a history of Fiji leaf gall and downy mildew disease was continued to reduce the possibility of recurrence in the fields.

A total of 7440 hectares of cane were inspected for major diseases and pests of which 612 ha were plant and 6828 ha were ratoon (Table 3).

Table 3: Monthly Disease Inspection Summary – 2008

Months	No. of farms inspected	Area inspected (ha)		Fiji leaf gall stools infected	
		Plt.	Rat.	Plt.	Rat.
Jan	63	2.05	107.07	0	0
Feb	420	76.84	586.99	0	39
Mar	572	46.82	739.41	25	128
Apr	755	106.58	918.40	0	116
May	577	57.20	686.22	0	29
Jun	584	76.10	557.98	0	0
Jul	684	109.82	651.48	0	0
Aug	573	50.94	581.64	0	44
Sep	608	37.83	686.30	0	630
Oct	564	14.33	726.75	0	2154
Nov	284	14.75	324.37	11	565
Dec	211	19.14	261.65	0	183
Total	**5895**	**612.40**	**6828.26**	**36**	**3888**

The performance of the Disease Control Unit in the Rarawai mill area was encouraging considering the problems of some of our vehicles that were continuously maintained

Fiji leaf gall disease (Fiji disease virus) was found in the Lautoka mill and Rarawai mill area and only on Mana (Table 4).

Table 4: Cane Variety Inspection for 2008

Varieties	No. of farms inspected	Area inspected (ha)		Fiji leaf gall stools infected	
		Plant	Ratoon	Plant	Ratoon
Aiwa	5	0.49	2.20	0	0
Beqa	3	0.03	3.12	0	0
Galoa	111	2.61	135.46	0	0
Homer	4	0	4.64	0	0
Kaba	130	23.04	102.40	0	0
Mali	246	24.60	287.30	0	0
Mana	3969	261.04	4435.04	36	3888
Naidiri	546	231.79	523.67	0	0
Ragnar	310	22.24	479.86	0	0
RS*	2	1.20	0.63	0	0
UV*	28	11.81	22.07	0	0
Vatu	333	17.47	568.83	0	0
Waya	208	16.08	263.40	0	0
Total	**5895**	**612.40**	**6828.26**	**36**	**3888**

* UV – unapproved, RS – Research.

Mana was the only variety infected with Fiji leaf gall disease. The varieties Vomo, Yasawa, and Ono were not recorded as being inspected and this may show the non-preference of growers to grow these varieties.

Downy mildew disease (DOM) has been successfully eradicated and not recorded since 1996 but we continue to monitor cane farms that are planting maize near the cane fields in sectors that are prone to downy mildew disease.

Fiji leaf gall and ratoon stunting disease continues to be our major disease.

With vigorous rouging and increased awareness programme, the disease can be kept at manageable levels.

Geographical Information System

Status:

The GIS's Drasa Pilot project finally came to an end in late 2008 with the project leader Mr. James Barringer declaring a 93% improvement in the cadastral line and lease parcels. The project was designed to be a base for the GIS system in the sugar industry thus the project is far from completion in terms of the number of sectors (37) remaining after the 93% completion of Drasa. A GIS officer has been appointed by SRIF to handle this tedious task that lay ahead for the GIS project of the sugar industry.

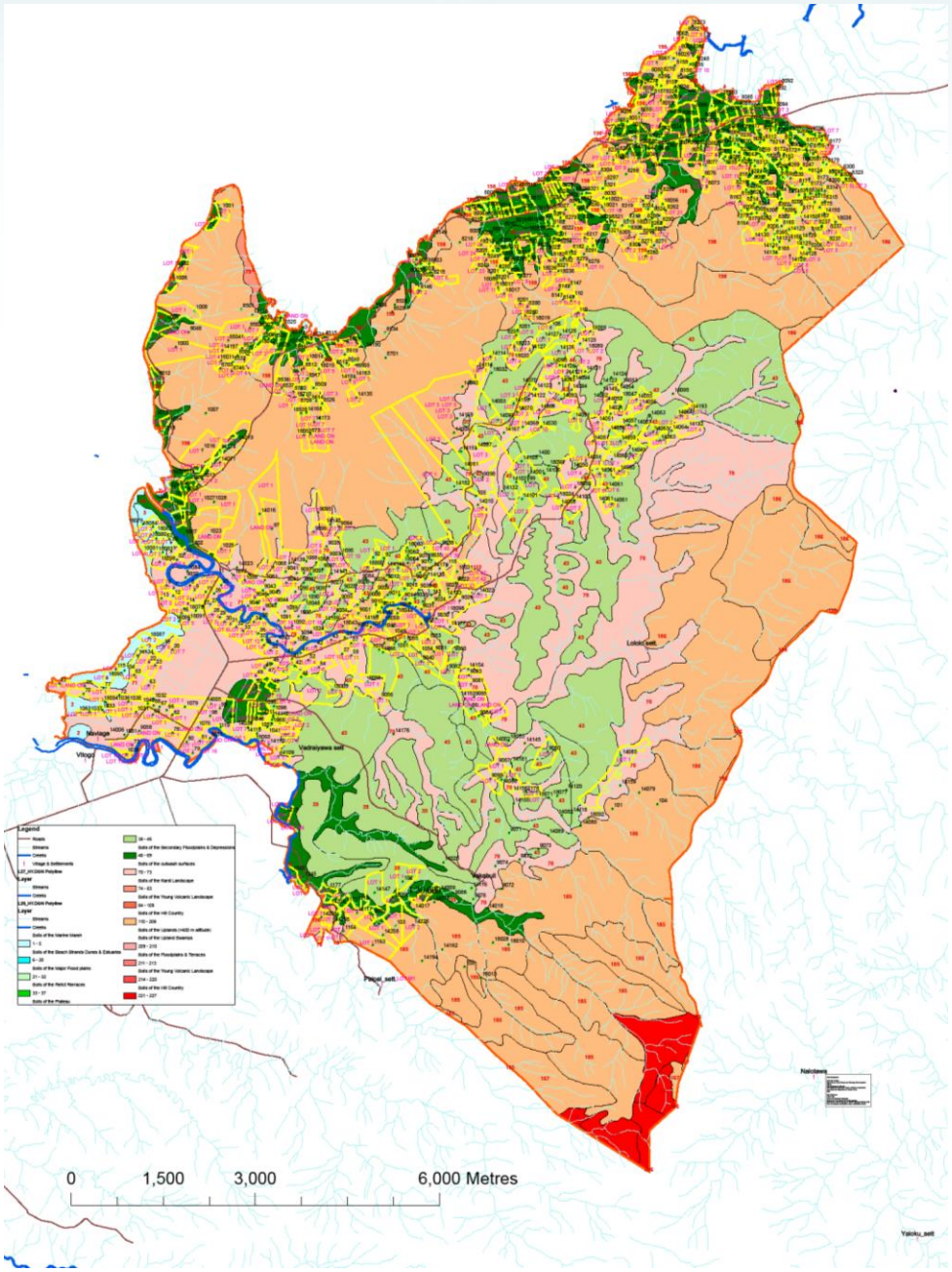


Figure 1: Completed Drasa Sector pilot project.

Information Communication Technology

Status:

The operation of the ICT infrastructure has been a day-to-day work. Server maintenance and backup have been regularly carried out. The connections to all substations are in proper operations except that terminal services cannot connect to the terminal servers (VAX) at FSC from these locations.

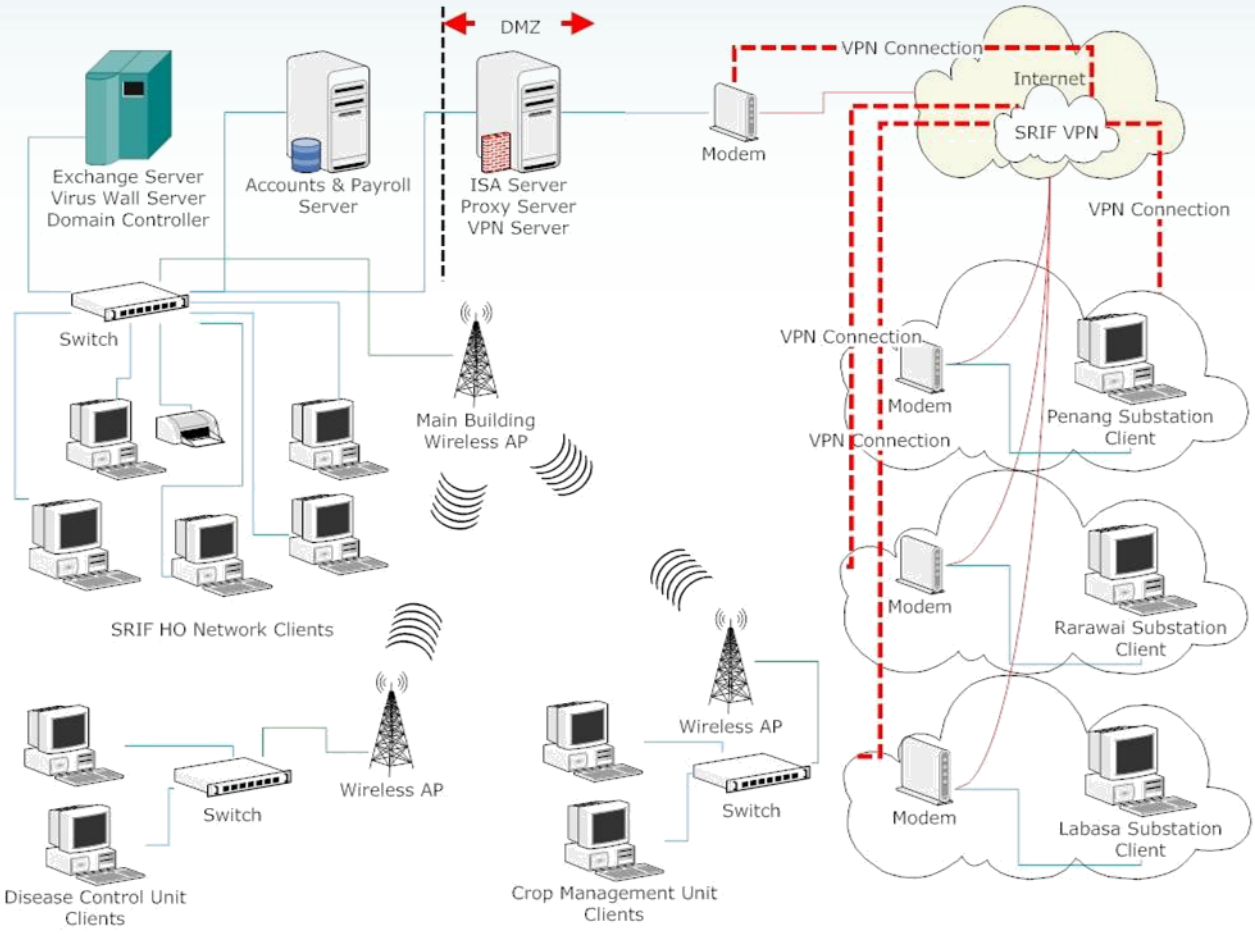


Figure 1: SRIF network layout

Technology Transfer

A. Technology Transfer meetings

A total of twenty six (26) meetings was conducted till the end of November 2008. An average of 30 attended the meetings. Whilst this number is smaller, the meeting will make an impact on the growers with regards to SRIF's activities.

Technology transfer meetings were held in all the districts on Viti Levu and Vanua Levu. The meetings were organised in key areas with the assistance of the Field Department of FSC.

B. Meet Individual Growers

As part of technology transfer each staff were allocated 25 growers. The first round of inspection by the staff of respective growers they were allocated involved making an assessment of the reasons why the yields are low if it is indeed low. The second round involves the staff informing the grower as to what needs to be done to improve the yields in the can farm.

The survey of selected growers' interviews indicated that the main problems facing the growers were as follows:

- Timing of fertilizer delivery
- Weed (cost, compatibility and rates)
- Drainage (blocked drain, water logging)
- Harvesting and transportation (high cost, harvesting quota problems)
- Labour (cost and availability)

C. Extension

Group Meetings

Each Extension Officer was assigned 3 to 4 Cane Sectors consisting of around 1,700 active growers. The group approach was adapted for maximum extension coverage in shortest time possible. Each Extension Officer's area of responsibility was divided into groups of 25 to 35 growers.

The Extension Officer conducted education and training meetings in each group at least one time in every 12 to 15 weeks.

During the year, the following topics were covered in these meetings;

- ✓ Establishment of New Cane Crop;
- ✓ Ratoon Cane Management Practices;
- ✓ Effective Weed Control in Sugar Cane;
- ✓ How Weed Killers Works;
- ✓ Farm Planning and budgeting.

Grower Demonstration Trials (GDT)

The Extension Officers also conducted demonstration trials in their respective areas. The following GD Trials were laid;

- ✓ Intercropping with cane;
- ✓ Promoting cane variety: LF91/1925 and Naidiri;
- ✓ Effect of different Herbicides;
- ✓ Trash Management in Ratoon Cane.

Specialized Advisory Service (SAS)

The Extension Officers were required to check and ensure that all growers programmed to plant cane under Accelerated Cane Planting Program were using the best available seed material. They also provided other services such as soil sampling for fertilizer advisory service, types of herbicides to be used and training on base cane cutting

Field Day

Successful Field days were held in the following sectors;

- ✓ Veisaru Sector;
- ✓ Tagitagi Sector
- ✓ Natova Sector
- ✓ Nawaicoba Sector

Theme at these Field days was "maximizing farm profitability" through intercropping except at Nawaicoba Sector which was promotion of

cane variety LF91/1925. Some 50 to 70 growers were in attendance in each Field Day.

Apart from these Field days, mini information days were held to demonstrate the result of Grower Demonstration trials and teaching of skills.

Mill Visit

Visits to the four mills to hold meeting/discussion with the Field Staff to provide guidance and support in extension matters were done regularly. A review of extension activities performance was conducted to assist them in their foreword planning.

A three–year strategic plan for extension was submitted for consideration for 2008 to 2010. The plan contained extension goals and action plan.

Extension Training Workshop

During the year, two Extension Training Workshops were held for FSC Field and Extension staff. The workshops were held twice in the year for two days each.

Other Activities

SRIF was also involved in the following activities for the sugar industry restructure programme;

- ✓ Conducting field audit of Accelerated Cane Replanting Program;
- ✓ Investigating the causes and reasons for lower POCS in cane;
- ✓ Leading SCOF Sub Committee on Expansion of Cane Perimeter at Labasa Mill area;
- ✓ Developing cane farm budget as required by the Sugar Industry Task Force;
- ✓ Reviewing Harvesting & Delivery Trials conducted by SCOF;
- ✓ Advising on a proposed Mechanical Cane Loading equipment assembly;
- ✓ Participating in the discussions to reform FSC Field operation and organizational structure.

Figure 1: TT Meeting in progress

Figure 2: Extension Field Day

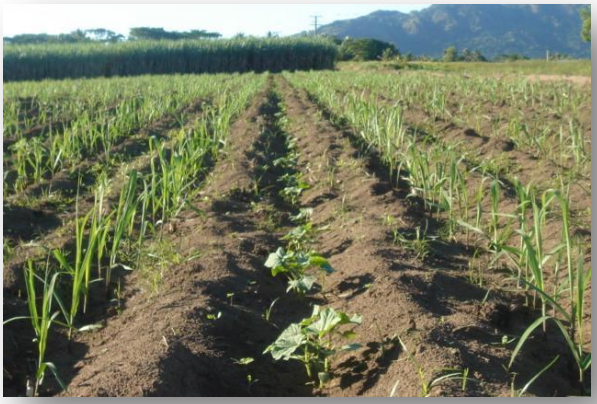


Figure 3: Grower Demonstration Trial

FIELD ACTIVITES AND CROP PRODUCTION TABLES

Rainfall

Table 1: Rainfall (mm) for all mills from May 2007 to April 2008

Mills	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Lautoka Mill	41.9	0.5	48.8	21.6	201.8	111.4	268.0	271.7	672.2	553.5	231.8	117.8	2541.0
Monthly Rainfall	41.9	0.5	48.8	21.6	201.8	111.4	268.0	271.7	672.2	553.5	231.8	117.8	2541.0
No. of raindays	8	1	6	5	16	10	16	18	24	23	21	14	162
96 years avg.	97.2	64.6	49.5	70.6	70.3	89.6	123.1	189.7	298.5	319.7	313.0	182.2	1868
Rarawai Mill													
Monthly Rainfall	13.8	7.1	42.2	14.3	239.2	140.0	305.4	285.4	826.5	604.6	372.4	270.9	3121.8
No. of raindays	6	2	4	4	11	14	18	16	22	24	19	14	154
119 years avg.	77	35.7	27.7	100	103.4	147.0	221.9	239.4	351.4	357.4	361.3	295.8	2318.0
Labasa Mill													
Monthly Rainfall	101.4	55.5	29.5	48.7	327.2	131.0	310.4	438.9	655.0	332.6	305.0	255.8	2991.0
No. of raindays	9	8	4	8	18	17	21	21	26	24	19	22	197
115 years avg.	109.1	64.5	47.0	50.5	102.3	101.4	203.6	251.7	363.0	358.9	378.4	238.1	2268.5
Penang Mill													
Monthly Rainfall	80.2	25.0	35.8	30.6	204.3	45.4	329.9	557.8	1240.5	570.0	200.0	222.1	3541.6
No. of raindays	13	4	5	10	16	12	18	20	26	19	16	26	185
107 years avg.	120.4	68.6	51.9	93.4	85.0	146.5	149.5	238.3	432.7	351.0	410.5	387.7	2535.5

Fertilizer usage

The NPK usage (kg/hectare) in all mill areas (2001 – 2009 Crop) is shown in Table 2. There has been a significant decline in fertilizer usage at all mills in the last five years. This is mainly due to growers' reluctance to invest in cane farming due to uncertainty of renewal of cane leases and threat of declining cane price.

Table 2: N, P, K usage (kg/ha) in all mills (Crop Years 2001 -2008)

Mill	Fertilizer	2001	2002	2003	2004	2005	2006	2007	2008	2009
Lautoka	**N**	51.1	68.9	79.0	75.5	82.1	79.5	76.0	67.5	63.5
	P	8.9	11.9	13.6	13.1	13.9	13.3	12.9	11.7	11.5
	K	35.4	47.7	56.0	53.8	59.0	58.4	56.7	50.2	42.9
Rarawai	**N**	60.3	72.8	82.5	81.7	72.0	81.3	83.8	77.0	58.6
	P	12.3	11.6	13.5	14.0	12.6	12.6	13.5	13.0	9.7
	K	40.9	53.1	58.6	57.5	55.0	59.3	59.2	47.8	40.3
Labasa	**N**	94.7	87.4	96.5	66.9	113.8	100.8	104.0	78.8	71.4
	P	18.5	18.1	19.3	13.7	22.8	20.1	20.5	15.7	13.9
	K	74.6	61.0	68.0	47.3	81.2	72.0	74.5	56.5	47.9
Penang	**N**	73.6	89.4	82.4	68.0	103.7	85.3	82.2	86.7	71.8
	P	12.5	15.2	14.8	13.9	18.6	15.7	14.8	15.2	12.3
	K	52.8	64.3	59.5	56.3	76.6	65.8	64.6	68.1	49.2
All mill avg.	**N**	67.7	76.8	85.2	74.4	89.9	86.7	87.0	75.4	64.9
	P	12.9	13.8	15.2	13.6	16.4	15.2	15.5	13.6	11.7
	K	49.2	49.5	60.4	53.4	65.6	63.0	63.3	54.8	44.0

Table 3: Area Harvested and amounts of N, P, K used in the Fiji Sugar Industry, 1987 - 2009 crop.

Crop Year	Nutrients Applied in Tonnes			Proportions		
	N	P	K	N	P	K
1987	6769	501	1154	13.5	1.0	2.3
1988	8002	733	1426	10.9	1.0	1.9
1989	10141	885	2382	11.5	1.0	2.7
1990	7777	649	1774	12.0	1.0	2.7
1991	8347	643	1886	13.0	1.0	2.9
1992	6551	870	3336	8.5	1.0	3.8
1993	6844	1186	4506	5.8	1.0	3.8
1994	7158	1380	4945	5.2	1.0	3.6
1995	7660	1335	5315	5.7	1.0	4.0
1996	7520	1413	5193	5.3	1.0	3.7
1997	7050	1339	4885	5.3	1.0	3.6
1998	7050	1351	1885	5.2	1.0	3.6
1999	7852	1597	5406	4.9	1.0	3.4
2000	6902	1249	4821	5.5	1.0	3.9
2001	4710	901	3427	5.2	1.0	3.8
2002	4811	864	3101	5.6	1.0	3.6
2003	5187	927	3681	5.6	1.0	4.0
2004	4471	816	3206	5.5	1.0	3.9
2005	5591	1020	4079	5.5	1.0	4.0
2006	5212	914	3944	5.7	1.0	4.3
2007	3963	715	2880	5.5	1.0	4.0
2008	4194	758	3047	5.5	1.0	4.0
2009	3960	713	2686	5.6	1.0	3.8

Appendix 1 : Main features of 2008 season compared with 2007

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Total registrations	6662	6650	5554	5488	4172	4239	2306	2306	18694	18683
Total farm basic allotments (tonnes)	1281722	1066915	1123500	111590	981086	884890	326996	326996	3713304	2390391
Total registered area (hectares)	27872	27726	23710	23229	19682	19897	10918	10918	82182	81555
Total area cultivated (hectares)	20108	27726	21070	20403	18113	17977	5102	5101	64393	71207
Total area harvested (hectares)	16376	15267	16892	15722	14636	15515	4655	4403	52558	50907
Total farm harvest quotas (tonnes)	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Sugar make actual(tonnes)	72747	72672	76775	62117	66640	51341	21256	21837	237418	207967
Tonnes 94 N.T sugar	75656	77311	78786	63954	68255	53160	21858	23231	244555	217656
Yield tonnes 94 N.T.sugar per hectare	4.62	5.06	4.66	4.06	4.66	3.43	4.70	5.28	4.65	4.45
Tonnes cane per tonnes sugar 94 N.T.	9.82	10.07	9.75	10.99	11.20	11.37	10.80	10.16	10.24	42.59
%POCS	11.25	10.7	11.60	10.8	10.44	11.02	11.45	10.54	11.19	43.06
Cane purity average for season	81.6	81.4	82.3	79.9	80.1	80.8	83.6	80.8	81.9	80.7
Tonnes cane harvested	741231	770569	738478	732165	769138	604314	229844	214572	2478691	2321620
Tonnes cane crushed	739329	770569	740381	732361	769138	604314	229844	214572	2478691	2321816

Appendix 2: Monthly rainfall(mm) for 2008 compared with average since commencement of records (to nearest mm)

Mills	No. of years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Lautoka	**2008 actual**	672.2	553.5	231.8	117.9	225.9	112.3	121.8	1.1	26.4	103.3	216.2	119.3	2501.7
	99 yrs avg. to 2006	292.2	318.5	317.4	183.3	96.6	64.0	49.5	70.1	71.6	89.8	124.6	190.5	1868.1
Rarawai	**2008 actual**	826.5	604.6	372.4	270.9	173.2	54.7	52.1	9.2	20.7	80.9	374.8	180.4	3020.4
	122 yrs avg. to 2006	345.4	357.2	365.6	294.9	76.5	35.4	27.9	99.2	104.4	147.0	222.6	239.8	2315.9
Labasa	**2008 actual**	655.0	332.6	305.0	255.8	231.8	97.2	9.7	2.6	45.4	46.5	167.9	298.6	2448.1
	119 yrs avg. to 2006	358.3	359.9	381.0	237.3	109.0	64.4	46.9	50.4	104.1	101.5	204.5	253.3	2270.6
Penang	**2008 actual**	1240.5	570.0	200.0	222.1	271.0	104.4	18.5	74.6	38.3	20.5	381.4	242.3	3383.6
	110 yrs avg. to 2006	421.9	348.9	415.3	387.4	120.0	68.2	51.9	92.8	86.1	145.7	151.1	241.1	2530.4

Appendix 3: Crop production details

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2007	**2008**	**2007**	**2008**	**2007**	**2008**	**2007**	**2008**	**2007**	**2008**
Areas harvested (hectares)										
Plant	507	664.9	975	894	797	1366	411	334	2690	**3259**
First ratoon	809	517.3	1581	968	1370	1008	446	403	4206	**2896**
2nd ratoon	777	710.5	974	1533	1567	1323	435	394	3753	**3961**
Other ratoons	14283	13374	13361	12327	10902	11818	3363	3272	41909	**40791**
Total	16376	15266.7	16891	15722	14636	15515	4655	4403	52558	**50907**
Proportion of crop harvested according to area										
Plant	3.1	4.3	5.8	5.7	5.4	8.8	8.8	7.6	5.1	**6.4**
First ratoon	4.9	3.4	9.4	6.2	9.4	6.5	9.6	9.2	8.0	**5.7**
2nd ratoon	4.7	4.7	5.8	9.8	10.7	8.5	9.4	8.9	7.1	**7.8**
Other ratoons	87.2	87.6	79.1	78.3	74.5	76.2	72.3	74.3	79.7	**80.1**
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	65.6	65.7	55.4	57.9	65.5	47.2	60.2	53.9	61.1	**54.6**
First ratoon	58.6	59.8	51.6	55.5	66.2	50.7	57.1	49.8	58.3	**53.8**
2nd ratoon	50.5	55.9	47.7	50.0	57.4	44.0	49.1	49.1	52.5	**49.0**
Other ratoons	43.5	49.1	41.6	44.6	49.2	36.4	47.1	48.0	44.7	**44.0**
Average yield/ha	45.3	50.5	43.7	46.6	52.6	38.9	49.4	48.7	47.2	**45.6**
Main varieties crushed according to tonnes (%)										
Ragnar	0.4	0.4	0.4	0.5	22.8	22.2	0.1	0.1	6.6	**6.1**
Aiwa	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.4	**0.5**
Beqa		0.1			0.7	0.5			0.2	**0.1**
Galoa	0.1	0.1			5.2	4.8			1.5	**1.3**
Kaba	3.5	2.7	5.5	5.1	0.4	0.3	1.1	0.8	3.0	**2.7**
Mali					16.0	12.9	0.8	0.9	4.5	**3.4**
Mana	92.8	93.5	89.7	90.2			88.9	92.8	65.6	**68.1**
Naidiri	2.5	2.2	2.7	2.3	17.7	27.1	8.4	4.8	7.3	**9.0**
Vatu					27.1	24.6	0.4	0.3	7.6	**6.4**
Waya			1.0	1.1	9.4	6.7			3.0	**2.1**
LF91-1925		0.2		0.1						**0**
Expt./Others	0.3	0.3	0.1	0.2	0.2	0.6	0.1		0.3	**0.3**
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100**

Appendix 4: Rainfall (mm) at mill centres

Mill	For 12 months ended 31st December					For 12 months ended 30th September				
	2004	2005	2006	2007	**2008**	2004	2005	2006	2007	**2008**
Lautoka	1489	1580	1844.0	2362.7	**2501.7**	1670	1281	1923.8	2054.1	**2714**
Rarawai	1960	1745	2162.1	2805.3	**3020.4**	2393	1328	2110.8	2663.0	**3115.1**
Labasa	1568	1803	2152.7	2786.2	**2448.1**	1731	1411	2452.2	2207.6	**2815.4**
Penang	1573	1516	1824.0	2618.0	**3383.6**	1927	1330	1775.7	1991.0	**3672.5**

Appendix 5: Rainfall distribution affecting 2008 crop(mm)

Month	Period	Lautoka	Rarawai	Labasa	Penang
Jul'07	Early	0.8	0.3	19.7	0.8
	Mid	21.5	24.6	7.5	13.0
	Late	26.5	17.3	2.3	22.0
Aug'07	Early	3.4	8.9	31.0	17.0
	Mid	1.2	3.8	5.6	7.0
	Late	17.0	1.6	12.1	6.6
Sep'07	Early	1.6	0.0	82.2	9.0
	Mid	23.6	42.3	10.6	31.4
	Late	176.6	196.9	234.4	163.9
Oct'07	Early	0.0	28.5	18.8	0.0
	Mid	62.8	79.3	90.4	31.0
	Late	48.6	32.2	21.8	14.4
Nov'07	Early	106.0	100.2	17.8	145.2
	Mid	30.6	48.8	109.4	59.4
	Late	131.4	155.4	183.2	125.3
Dec'07	Early	16.9	15.1	214.9	311.1
	Mid	112.9	57.9	63.8	55.7
	Late	142.1	212.4	160.2	191.0
Jan'08	Early	252.4	266.7	163.0	451.0
	Mid	123.6	180.0	213.7	204.7
	Late	296.2	279.8	278.3	584.8
Feb'08	Early	244.4	225.5	126.0	196.7
	Mid	36.7	37.1	57.3	57.1
	Late	271.4	342.0	149.3	316.2
Mar'08	Early	49.0	148.6	69.6	9.2
	Mid	96.4	86.0	96.7	70.5
	Late	86.4	137.8	138.7	120.3
Apr'08	Early	43.6	163.3	112.7	77.5
	Mid	73.5	73.8	72.9	101.8
	Late	0.8	33.8	70.2	42.8
May'08	Early	121.5	79.6	108.7	56.1
	Mid	103.2	93.3	69.9	214.6
	Late	1.2	0.3	54.2	0.3
Jun'08	Early	4.7	6.2	15.4	20.0
	Mid	94.8	33.5	56.7	79.4
	Late	12.8	15.0	25.1	5.0
Jul'08	Early	73.8	40.9	7.2	16.0

Appendix 5: Rainfall distribution affecting 2008 crop(mm) Cont'd

Month	Period	Lautoka	Rarawai	Labasa	Penang
	Mid	0.0	0.0	0.8	2.5
	Late	48.0	11.2	1.7	0.0
Aug'08	Early	0.7	8.2	2.0	60.0
	Mid	0.3	0.0	0.0	1.0
	Late	0.1	1.0	0.6	13.6
Sep'08	Early	0.0	3.3	6.4	14.8
	Mid	20.0	13.2	39.0	1.2
	Late	6.4	4.2	0.0	22.3
Oct'08	Early	2.8	57.0	2.9	14.6
	Mid	41.2	21.0	33.0	5.0
	Late	59.3	2.9	10.6	0.9
Nov'08	Early	48.0	132.7	58.0	19.2
	Mid	42.7	8.3	56.3	45.7
	Late	125.5	233.8	53.6	316.5
Dec'08	Early	56.3	48.8	57.3	100.2
	Mid	42.2	40.4	92.6	71.5
	Late	20.8	91.2	148.7	70.6
Total		3424.2	3945.9	3734.8	4587.4

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				
		1981/85	1986/90	1991/95	1996/00	2001/05	2004	2005	2006	2007	**2008**
Lautoka	Plt	5904	4007	3634	2944	1042	1272	854	850	507	**1009**
	Rtn	18108	19743	20580	19701	19730	18876	18220	16275	15869	**14258**
	Total	24012	23750	24214	22645	20772	20148	19074	17125	16376	**15267**
Rarawai	Plt	4463	3574	2899	3164	1055	916	1045	1651	975	**894**
	Rtn	13836	14805	17360	14613	17585	17550	16496	15476	15916	**14828**
	Total	18299	18379	20259	17777	18640	18466	17541	17127	16891	**15722**
Labasa	Plt	2365	2512	3120	2597	1269	1035	1808	1341	797	**1366**
	Rtn	16306	17181	19604	18348	15911	15446	15232	15169	13839	**14149**
	Total	18671	19693	22724	20945	17180	16481	17040	16510	14636	**15515**
Penang	Plt	1697	1396	1386	1120	542	573	515	457	411	**334**
	Rtn	4036	5029	4958	4674	4568	4412	4418	4218	4244	**4069**
	Total	5733	6425	6344	5794	5110	4985	4933	4675	4655	**4403**
All mills	Plt	14429	11489	11039	9825	3908	3795	4222	4298	2690	**3603**
	Rtn	52286	56758	62502	57336	57794	56285	54366	51140	49868	**47304**
	Total	66715	68247	73541	67161	61702	60080	58588	55438	52558	**50907**

Appendix 7 : Tonnes of cane harvested

Mills	Average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/00	2001/05	2004	2005	2006	2007	**2008**
Lautoka	1254266	1048942	1283569	1216597	971454	1032127	890779	1051097	741231	**770569**
Rarawai	984244	1006366	1017374	957507	878509	878121	761704	1039474	738478	**732165**
Labasa	980634	1015166	1166055	1017061	840388	848533	910663	871031	769138	**604314**
Penang	310406	332592	291206	309205	239044	242408	225594	264498	229844	**214572**
All mills	3529550	3403066	3758204	3500370	2929395	3001189	2788740	3226100	2478691	**2321620**

Appendix 8 : Tonnes of cane per hectare harvested

Mills		Average for period of five seasons					Last five seasons individually				
		1981/85	1986/90	1991/95	1996/00	2001/05	2004	2005	2006	2007	**2008**
Lautoka	Plt	61.7	65.4	64.7	64.2	63.9	66.5	64.4	81.9	65.6	**65.7**
	Rtn	48.0	54.2	51.2	51.4	45.9	50.2	45.9	59.1	43.5	**49.1**
	Total	51.4	55.5	52.4	53.7	46.8	51.2	46.7	61.4	45.3	**50.5**
Rarawai	Plt	65.1	64.3	61.2	62.1	59.6	61.2	58.1	72.7	55.4	**57.9**
	Rtn	51.3	52.0	48.1	52.9	46.4	46.8	42.5	57.7	41.6	**44.6**
	Total	53.3	54.2	50.1	53.9	47.1	47.6	43.4	60.2	43.7	**46.6**
Labasa	Plt	63.9	58.9	59.3	56.5	59.7	64.6	63.1	64.1	65.5	**47.2**
	Rtn	50.8	51.5	50.4	47.4	47.6	50.6	52.3	49.2	49.2	**36.4**
	Total	52.5	51.5	51.3	48.6	48.9	51.5	53.4	52.7	52.6	**38.9**
Penang	Plt	63.3	63.1	57.2	62.6	54.2	53.7	52.2	63.8	60.2	**53.9**
	Rtn	50.5	48.6	43.1	51.2	46.4	47.9	47.1	56.4	47.1	**48.0**
	Total	54.3	51.1	46.0	53.3	46.8	48.6	45.7	56.6	49.4	**48.7**
All	Plt	63.5	62.6	61.2	61.8	58.3	62.8	60.8	71.1	61.1	**54.6**
Mills	Rtn	49.5	55.8	48.1	50.0	46.0	46.0	46.6	55.9	44.7	**45.0**
	Total	52.6	53.3	50.2	52.1	47.5	50.0	47.6	58.2	47.2	**45.6**

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

Mills	2008 hectares (A)			Hectares harvested as % various categories "A"	
	Registered (1)	Cultivated (2)	Harvested	(1)	(2)
Lautoka	27745.9	17552.5	15266.7	55.0	87.0
Rarawai	23229.1	20402.5	15722.1	67.7	77.1
Labasa	19681.6	18113.0	14635.6	74.4	80.8
Penang	10918	5100.7	4402.8	40.3	86.3
Total	81574.6	61168.7	50027.2	61.3	81.8

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

Mills	Rough average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/00	2001/05	2004	2005	2006	2007	**2008**
Lautoka	26	17	15	13	5	6	4	7	3	**4**
Rarawai	24	19	14	18	6	5	6	12	6	**6**
Labasa	11	13	14	12	7	6	11	10	5	**9**
Penang	29	22	23	19	11	11	10	11	9	**8**
All mills	21	17	16	15	7	6	7	10	5	**6**

Appendix 11: Plant and ratoon yields and percentage of total area harvested - 2008 Crop

Mills	Plant		First ratoon		Other ratoons		All cane	
	tc/ha	% Area	tc/ha	% Area	tc/ha	% Area	tc/ha	% Area
Lautoka	65.7	4.3	59.7	8.1	49.1	87.6	50.5	100.0
Rarawai	57.9	6	55.5	6	45.2	88.0	46.6	100.0
Labasa	47.2	10.7	50.7	8.5	40.2	80.8	38.9	100.0
Penang	53.9	7.6	49.8	9.2	48.1	83.2	48.7	100.0
All Mills	54.6	6.4	53.8	5.7	44.4	87.9	45.6	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	2004	2005	2006	2007	**2008**
Lautoka	12.19	12.00	12.50	11.42	11.45	11.28	11.52	10.65	11.25	**10.70**
Rarawai	12.12	12.09	12.90	11.35	11.87	12.09	11.46	11.49	11.60	**10.71**
Labasa	12.20	12.37	12.12	11.07	11.54	11.12	10.93	11.38	10.44	**11.02**
Penang	12.28	12.15	12.59	11.13	11.88	11.29	12.29	11.85	11.45	**10.54**
All Mill Avg.	12.15	12.27	12.51	11.24	11.69	11.45	11.54	11.34	11.19	**10.74**

Appendix 13: Weekly POCS in cane 2008 season

Week no.	Week ending	Lautoka	Rarawai	Labasa	Penang
1	16.06.08	10.11			9.24
2	23.06.08	10.00	9.15		9.03
3	30.06.08	10.10	9.27		9.56
4	07.07.08	10.47	9.66	11.07	9.72
5	14.07.08	9.95	9.77	11.07	10.14
6	21.07.08	10.46	9.81	11.58	9.97
7	28.07.08	10.83	10.47	11.30	10.21
8	04.08.08	10.82	10.46	11.29	9.94
9	11.08.08	11.03	10.71	11.14	10.30
10	18.08.08	10.73	10.96	11.09	10.22
11	25.08.08	10.92	11.36	11.10	10.67
12	01.09.08	11.02	11.52	11.48	11.70
13	08.09.08	10.85	11.70	11.73	11.35
14	15.09.08	10.84	11.79	11.57	10.94
15	22.09.08	10.88	11.62	12.39	11.24
16	29.09.08	10.87	11.91	9.93	11.03
17	06.10.08	10.76	10.40	11.33	9.60
18	13.10.08	10.60	11.97	11.31	11.63
19	20.10.08	10.58	11.69	11.37	11.34
20	27.10.08	11.40	11.75	11.05	11.27
21	03.11.08	10.75	10.25	10.07	10.25
22	10.11.08	10.77	10.96	7.78	10.91
23	17.11.08	10.70	11.23	10.21	11.22
24	24.11.08	10.60	10.40	10.45	
25	1.12.08		10.31	9.97	
26	8.12.08		9.72	9.29	
27	15.12.08		9.73	10.26	
28	22.12.08			9.21	
29	29.12.08			9.68	
30					
Season Average		**10.70**	**10.71**	**11.02**	**10.54**

Appendix 14 : Sugar produced (tonnes 94 N.T. equivalent) from area harvested

Mills	Tonnes sugar 94 N.T equivalent						
	2002	2003	2004	2005	2006	2007	**2008**
Lautoka	103867	103202	110684	97315	96875	75656	**77311**
Rarawai	118667	101324	100664	84258	106781	78786	**63954**
Labasa	90315	75830	87802	90347	83970	68255	**53160**
Penang	25691	25453	24716	24733	30937	21858	**23231**
All mills	338540	305809	323866	296653	318563	244555	**217656**

Appendix 15 : Sugar per hectare harvested (tonnes 94 N.T equivalent)

Mills	Average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/00	2001/05	2004	2005	2006	2007	**2008**
Lautoka	5.97	6.55	6.15	5.61	4.92	5.41	5.10	5.60	4.62	**5.06**
Rarawai	6.38	6.36	6.29	5.61	5.38	5.45	4.80	6.23	4.66	**4.06**
Labasa	6.20	6.20	6.00	4.95	4.97	5.20	5.30	5.09	4.66	**3.43**
Penang	6.34	5.70	5.47	5.42	4.65	4.81	5.01	6.63	4.70	**5.28**
Average	6.21	6.28	6.05	5.39	5.06	5.39	5.06	5.75	4.65	**4.28**

Appendix 16 : Length of season (weeks) - Start and finish of crushing (date)

Mills	Rough average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/2000	2001/05	2004	2005	2006	2007	**2008**
LS						28.1	25.6	32.4	24.0	**23.9**
Lautoka	29.3	28.8	28.0	29.7	27.6	Jun 22	Jun 07	Jun 05	Jun 07	**Jun 10**
						Jan 04	Dec 03	Jan 11	Nov 18	**Nov 21**
LS						23.9	20.9	30.8	23.8	**25.7**
Rarawai	26.4	26.2	25.3	26.5	24.2	Jun 16	Jun 01	May 31	Jun 18	**June 23**
						Dec 01	Oct 25	Jan 01	Nov 18	**Dec 15**
LS						25.2	29.1	29.0	29.1	**26.0**
Labasa	27.9	26.6	29.4	30.7	24.1	Jun 22	Jun 01	Jun 06	Jun 06	**Jun 30**
						Dec 08	Dec 15	Dec 25	Dec 25	**Dec 22**
LS						19.5	18.3	21.4	22.1	**22.2**
Penang	28.1	25.5	21.5	26.2	20.4	Jul 06	Jun 28	Jun 20	Jun 06	**Jun 11**
						Nov 20	Nov 11	Nov 16	Nov 06	**Nov 13**
All mills	28.4	26.8	26.1	28.2	24.1	24.2	23.5	28.4	24.8	**24.5**

Appendix 17 : Varietals performance

Varieties	Percent of hectares harvested									
	Lautoka		**Rarawai**		**Labasa**		**Penang**		**All Mills**	
	2007	**2008**	2007	**2008**	2007	**2008**	2007	**2008**	2007	**2008**
Ragnar	0.4	0.4	0.4	0.5	22.8	22.2	0.1	0.2	6.6	**5.8**
Waya			1.0	1.1	9.4	6.7			3.0	**3.9**
Mali					16.0	12.9	0.8	0.9	4.5	**6.9**
Homer										
Spartan										
Galoa	0.1	0.1			5.2	4.8			1.5	**2.5**
Aiwa	0.4	0.5	0.5	0.5	0.4	0.5	0.3	0.3	0.4	**0.5**

Appendix 17 : Varietals performance Cont'd

Varieties	Percent of hectares harvested									
	Lautoka		Rarawai		Labasa		Penang		All Mills	
	2007	**2008**	2007	**2008**	2007	**2008**	2007	**2008**	2007	**2008**
Ono										
Yasawa										
Vomo										
Mana	92.8	92.8	89.7	90.2			88.9	92.8	65.6	**91.9**
LF 91 - 1925				0.1						**0.1**
Kaba	3.5	3.3	5.5	5.1	0.4	0.3	1.1	0.8	3.0	**2.4**
Vatu					27.1	24.6	0.4	0.3	7.6	**12.5**
Beqa					0.7	0.3			0.2	**0.3**
Naidiri	2.5	2.5	2.7	2.3	17.7	27.1	8.4	4.8	7.3	**9.2**
Exp.	0.2	0.2							0.1	**0.2**
Other var.	0.1	0.2	0.2	0.2	0.3	0.6	0.1		0.2	**0.3**

Appendix 18 : Planting - areas

Mills	Hectares planted (A)					A as percentage of registered area					A as percentage of area cultivated				
	2004	2005	2006	2007	**2008**	2004	2005	2006	2007	**2008**	2004	2005	2006	2007	**2008**
Lautoka	881	848	611	800	**1009**	3	3	2	3	**4**	3	3	3	4	**7**
Rarawai	1078	1344	1096	840	**1247**	4	5	5	4	**5**	5	6	5	4	**6**
Labasa	1504	1241	893	1521	**1365**	7	5	5	8	**8**	7	7	5	8	**8**
Penang	525	520	453	453	**295**	5	5	4	4	**3**	10	9	8	9	**6**
Total	3988	3950	3053	3614	**3916**	4	4	4	4	**5**	5	5	4	6	**6**

Appendix 19: Planting - varieties (percentage of total area planted)

Year	*Varieties*	Lautoka	Rarawai	Labasa	Penang	All mills
2006	Ragnar	0.8	0.4	7.2	-	2.4
2007	Ragnar	-	0.2	6.9	-	3.0
2008	**Ragnar**	**0.4**	**0.1**	**8.4**		
2006	Waya	-	1.9	3.4		1.7
2007	Waya	-	1.3	5.4	-	2.6
2008	**Waya**	**-**	**-**	**7.1**		
2006	Mana	85.0	85.9	-	84.8	60.8
2007	Mana	90.8	88.8	-	84.8	51.4
2008	**Mana**	**93.5**	**91.2**			
2006	Galoa	0.8	-	6.1	-	1.9
2007	Galoa	0.2	-	4.4	-	1.9
2008	**Galoa**	**0.1**	**-**	**7.7**		
2006	Vatu	-	-	9.9	-	2.8
2007	Vatu	-	-	7.5	-	3.2
2008	**Vatu**	**-**	**-**	**7.6**		
2006	Mali	-	-	6.9	0.2	2.0
2007	Mali	-	-	6.6	0.2	2.8
2008	**Mali**	**-**	**-**	**9.8**		
2006	Aiwa	0.5	-	0.4	-	0.2
2007	Aiwa	0.5	-	0.2	-	0.2
2008	**Aiwa**	**0.5**	**-**	**0.4**		

Appendix 19: Planting - varieties (percentage of total area planted)

Year	*Varieties*	Lautoka	Rarawai	Labasa	Penang	All mills
2006	Beqa	0.6	-	-	-	0.1
2007	Beqa	1.0	-	0.1	-	0.3
2008	**Beqa**	**0.1**	**-**	**-**		
2006	Kaba	6.4	6.0	-	-	3.5
2007	Kaba	3.9	5.8	0.1	-	2.3
2008	**Kaba**	**2.7**	**5.4**	**0.3**		
2006	Naidiri	4.4	5.2	65.3	15.0	23.8
2007	Naidiri	2.3	2.4	68.1	15.0	31.6
2008	**Naidiri**	**2.2**	**2.1**	**57.7**		
2007	LF-91-1925		-			
2008	**LF91-1925**	**0.3**	**0.4**			
2006	O/Varieties	1.5	0.5	0.7	-	0.7
2007	O/Varieties	1.3	1.5	0.7	-	0.7
2008	**O/Varieties**		**0.8**	**0.9**		

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		Road transport direct to mill carrier		Total	
		Tonnes	% of Total	Tonnes	% of Total	Tonnes	% of Total	Tonnes	% of Total
Lautoka	2004	34226	3	279657	27	718244	70	1032127	100
	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**	**2.1**	**179905**	**23.3**	**574754**	**74.6**	**770567**	**100**
Rarawai	2004	47430	5	310315	35	520376	59	878121	100
	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**
Labasa	2004	22651	3	272006	32	553876	65	848533	100
	2005	18563	2	249669	27	642431	71	910663	100
	2006	3391	1	238591	27	629049	72	871031	100
	2007	2910	0	233371	31	532847	69	769138	100
	2008	**1275**	**0**	**179815**	**29.8**	**423224**	**70**	**604314**	**100**
Penang	2004	15118	6	49799	21	177491	73	242408	100
	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**
All mills	2004	119425	5	911777	36	1969987	59	3001189	100
	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**

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**

Approved Varieties

Sugarcane varieties approved for planting during 2003 are: - Mana, Aiwa, Beqa, Galoa, Kaba, Mali, Ragnar, Vatu, Yasawa, Waya, Spartan, Ono, Vomo, Homer, Naidiri and LF91-1925. Varieties are recommended to growers based on their soil type, giving a choice of at least three varieties as laid down in the Master Award.

Lautoka		
Sector	Soil	Variety
Olosara	Rich alluvial soils	Ragnar, Yasawa, Aiwa, Beqa, Vomo, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Beqa, Ragnar, Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Mana, Mali, Kaba, Naidiri, LF91-1925
Cuvu	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Beqa, Ragnar, Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Lomawai	Flat : Fertile soils	Ragnar, Yasawa, Kaba, Vomo, Aiwa, Beqa, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Beqa, Ragnar, Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Yako	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Nawaicoba	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa,Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Malolo	Flat : Fertile soil	Ragnar, Yasawa, Vomo, Vatu, Kaba, Aiwa, Beqa, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Qeleloa	Rich alluvial soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Naidiri, LF91-1925
Meigunyah	Flat : Fertile soils	Ragnar, Kaba, Yasawa, Vomo, Vatu,Aiwa,Beqa, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Legalega	Flat : Fertile soils	Ragnar, Yasawa,Vomo, Vatu, Aiwa,Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Galoa, Homer, Naidiri, LF91-1925

Lautoka		
Sector	Sector	Sector
Natova	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Lautoka	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Saweni	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Vomo, Aiwa, Beqa,Kaba,Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925
Lovu	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa,Mana, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Drasa	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Kaba, Aiwa, Beqa, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Mana,Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Sandy soils	Kaba, Mana, Galoa, Naidiri, LF91-1925

Rarawai		
Sector	Soil	Variety
Varoko	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Mota	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Naloto	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925

Rarawai		
Sector	Soil	Variety
Koronubu	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Veisaru	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Rarawai	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Aiwa, Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Varavu	Flat : Fertile soils	Ragnar, Yasawa, Spartan, Aiwa, Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
Tagitagi	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Beqa, Ragnar, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Homer, Naidiri, LF91-1925
	Salt affected areas	Kaba, Mana, Galoa, Naidiri, LF91-1925
Yaladro	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Mali, Vatu, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Waya, Homer, Naidiri, LF91-1925
	Salt affected areas	Kaba, Mana, Galoa, Naidiri, LF91-1925
Drumasi	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Kaba, Ragnar, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Kaba, Mali, Mana, Waya, Vatu, Homer, Naidiri, LF91-1925
	Salt affected areas	Kaba, Mana, Galoa, Naidiri, LF91-1925

Labasa		
Sector	Soil	Variety
Waiqele	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa,Beqa,Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Homer, Naidiri, LF91-1925
Wailevu	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Homer, Naidiri, LF91-1925
	Saline soils	Mali, Galoa, Vatu, Naidiri, LF91-1925
Vunimoli	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Homer, Naidiri, LF91-1925

Labasa		
Sector	Soil	Variety
Labasa	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Homer, Naidiri, LF91-1925
	Saline soils	Mali, Galoa, Vatu, Naidiri, LF91-1925
Bucaisau	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Waya, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Waya, Homer, Naidiri, LF91-1925
	Saline soils	Mali, Galoa, Waya, Vatu, Naidiri, LF91-1925
Wainikoro	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Waya, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Kaba, Waya, Homer, Naidiri, LF91-1925
	Saline soils	Mali, Galoa, Waya, Vatu, Naidiri, LF91-1925
Daku	Flat : Fertile soils	Ragnar, Yasawa, Vomo, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Spartan, Kaba, Mali, Waya, Aiwa, Beqa, Naidiri, LF91-1925
	Poor soils	Mali, Galoa, Waya, Vatu, Homer, Naidiri, LF91-1925
Seqaqa	Poor soils	Ragnar, Mali, Ono, Kaba, Aiwa, Beqa, Homer, Naidiri, LF91-1925

Penang		
Sector	Soil	Variety
Nanuku	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Waya, Kaba, Mali, Vatu, Aiwa, Naidiri, LF91-1925
	Poor soils	Waya, Mana, Kaba, Mali, Homer, Naidiri, LF91-1925
	Salt affected areas	Mana, Kaba, Galoa, Naidiri, LF91-1925
	Viti Vanua area	Mana, Kaba, Mali, Ragnar, Naidiri, LF91-1925
Malau	Rich alluvial soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Waya, Ragnar, Kaba, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Mana, Kaba, Mali, Homer, Naidiri, LF91-1925
	Salt affected areas	Galoa, Kaba, Mana, Naidiri, LF91-1925
Ellington I & II	Flat : Fertile soils	Ragnar, Yasawa, Vatu, Aiwa, Beqa, Kaba, Naidiri, LF91-1925
	Medium soils	Waya, Ragnar, Kaba, Mali, Vatu, Beqa, Aiwa, Naidiri, LF91-1925
	Poor soils	Mana, Kaba, Mali, Homer, Naidiri, LF91-1925
	Salt affected areas	Galoa, Mana, Kaba, Naidiri, LF91-1925

SRIF Employees

MANAGEMENT STAFF
STAFF
Jai Gawander – Chief Executive Officer
Hemraj Mangal - Manager Extension Services
Sanjay N Prakash - Finance & Admin Manager
Prema N Naidu - Research Officer
Saimone Johnson - Senior Scientific Officer
Ashween N Ram - Senior Scientific Officer
Matrishwa C Rao - Scientific Officer
Desmond V Kumar - Scientific Officer
Jeetendra Patel - Scientific Officer
Pedro N B Rounds - Scientific Officer
Amit R Singh - Scientific Officer
Nemani Soli - Technical Officer
Karuna Garan - Technical Officer
Rajendra Krishna - Technical Officer
Abhinesh Chand – Extension Officer
Shiva Ram – Extension Officer
Devendra Sharma – Extension Officer
Ronil Prasad – Extension Officer
Josese Lomani – Extension Officer
Satye Raj – Extension Officer
Rajendran Kumaran – Extension Officer
Parmen Barma – Extension Officer
Shireen Lata – Extension Officer
Rajnesh Prasad – Extension Officer
Atish Chand – Extension Officer
Farzana Bhamgi – Extension Officer
Maika Toga – Extension Officer
Nitika Natasha – Corporate assistant
Ronal Kumar – Junior Corporate Officer
Jainesh Ram – Technical Assistant
Samuel Work - Technical Field Assistant

CLERKS AND SUPERVISORS
Meena Nair – Administrative Assistant
Maciu Tale - Technical Field Assistant
Monika Lal - Lab Technician
Muni Sangeeta Gounder - Lab Technician

SUPPORT STAFF
CROP MANAGEMENT
Ilimeleki Katuba, Kailash Kumar H., Subram Naidu, Navin Reddy, Raj Kumar, Suresh Mani, Sat Narayan, Lachman, Hans Ram

CROP IMPROVEMENT
Solomone Tusasa, Aven Lal, Ajay Anand Prasad, Jonetani Talemaitoga

CROP PROTECTION
Bhaskaran Pillay, Naleen Krishna, Raj Kumar D., Dhirendra Chand Rao, Ashok Kumar, Mukesh Kumar

DISEASE CONTROL UNIT
Vijay Nand Sharma, Dinesh Dutt, Permal Samy, Manoj Dutt, Vijay Dutt, Shalend Naidu, Avinesh Sami, Isireli Qio, Ramesh Chand, Surindar Singh, Kamal Nabi, Ashwin Prasad, Chandar Segran Pillay, Semesa Navara, Raja Ram, Serevi Nauvi, Krishan Chandra, Log Nadan, Mosese Turaga, Rahimat Ali, Rajendra Prasad, Rohil Datt Ram, Subhash Chand, Surendra Kumar, Suruj Kumar, Madho, Pushp chand, Arvind Mani, Satendra Singh.

ESTABLISHMENT/SECURITY
Jai Ram Mudaliar, Shiu Nadan, Tarun Sami, Ram Kumar, Aporosa Rasavul

COMMERCIAL SERVICES

Consolidated Estate Report

The vision of Sugar Research Institute is to transform all our Estates into a model farm by increasing yields and reducing cost. This vision can only be achieved if proper and timely cane management practices are followed plus the automation of activities and assuming the weather is favorable.

Drasa Estate

During the year efforts were made to control weeds inside and around the cane fields, upgrading drains and increase cane planting. Some success was achieved.

The total contract area was 163.1 hectares, total available area was 126.9 hectares and area under cane was 114.8 hectares. All cultivation, fertilization and harvesting was given out on contract.

Approximately 2.3% (2.7ha) of total area was used for trial planting whilst the rest was used for commercial cane planting. A total of 6.0 hectares was under plant crop and 6.1 was fallow. Because of adverse weather conditions all the fallow area was not planted.

Total cane harvested at Drasa Estate in 2008 season was 7118 tonnes from an area of 114.8 hectares with a yield of 62 tpha. The production of cane per hectare decreased from 70.1tpha in 2007 to 62tpha in 2008 which was an 11.6% decrease in cane yield. Early in the season 3 cyclones were experienced whilst 2 cyclones struck the Fiji Islands (Daman 05–09 Dec 07 and Gene 28–29 Jan 08) cyclone Funa went past the Fiji group.

The crop was badly shaken by the strong winds and heavy suckering was visible. It was likely that chemical fertilizer would have leached because of the flooding. Above average rainfall was received during the months of January to May 08 (2019mm). The decline in yield was attributed to three cyclones with heavy flooding that caused lodging, heavy suckering, and fertilizer leaching and soil compaction. In some fields, uprooting of stools caused by mechanical harvesting was evident.

During the 2008 season a total of 2691mm of rainfall was received and this was 112mm less compared with 2007 season (2803mm).

Table below shows the production figures for the last five years

Year	Ha	Tonnes	Yield
2004	105.0	7017	**66.8**
2005	105.7	8245	**78.0**
2006	113.5	8225	**72.5**
2007	104.8	7343	**70.1**
2008	**114.8**	**7118**	**62.0**

Waqadra Estate

Waqadra Estate has a total 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 4126 tonnes. The area is comprised mainly with rich alluvial soil with uneven distribution of latosols in elevated blocks.

The cane production for year 2008 was 4252 tonnes from 59.3 ha (71.6 tpha) whereas 4150 tonnes was cut and delivered to the mill from an area of 57.2 ha giving a yield of 72.5 tpha. A total of 102 tonnes was used as seed cane for planting at Estate, seed cane to growers and trials and lost to poor harvesting and rejected cane.

The table below gives a summary of the production in terms of cane produced in 2008.

Table 1.0 Cane production in terms of research and commercial.

Crop	Research			Commercial			Total		
	Hac	Tonnes	tc/ha	Hac	Tonnes	tc/ha	Hac	Tonnes	tc/ha
Plant	4.5	224	50	6.2	230	37	10.7	454	42
1R	3.5	142	41	-	-	-	3.5	142	41
2R	0.8	30	37	7.72	717	93	8.5	747	88
OR	6.9	636	92	29.7	2274	76	36.6	2910	79
Total	**15.7**	**1031**	**66**	**43.7**	**3221**	**74**	59.33	**4252**	**72**

Figure 1 below illustrates the distribution of rain experienced in the 2007-2008 season. The extensive rain during the growth period (Jan08-Apr08) affected the yield of the crop and affected drainage also.

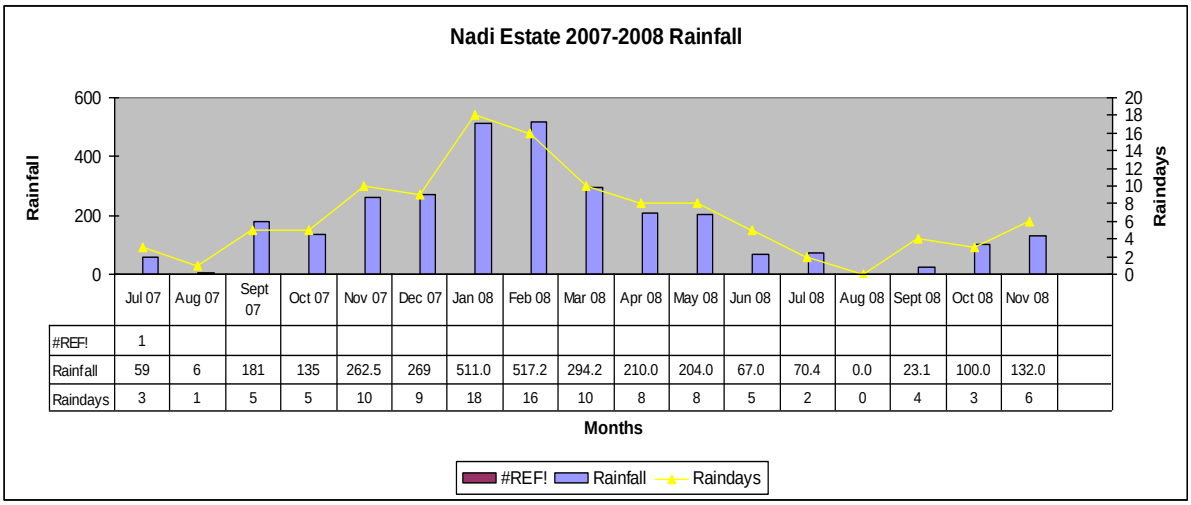
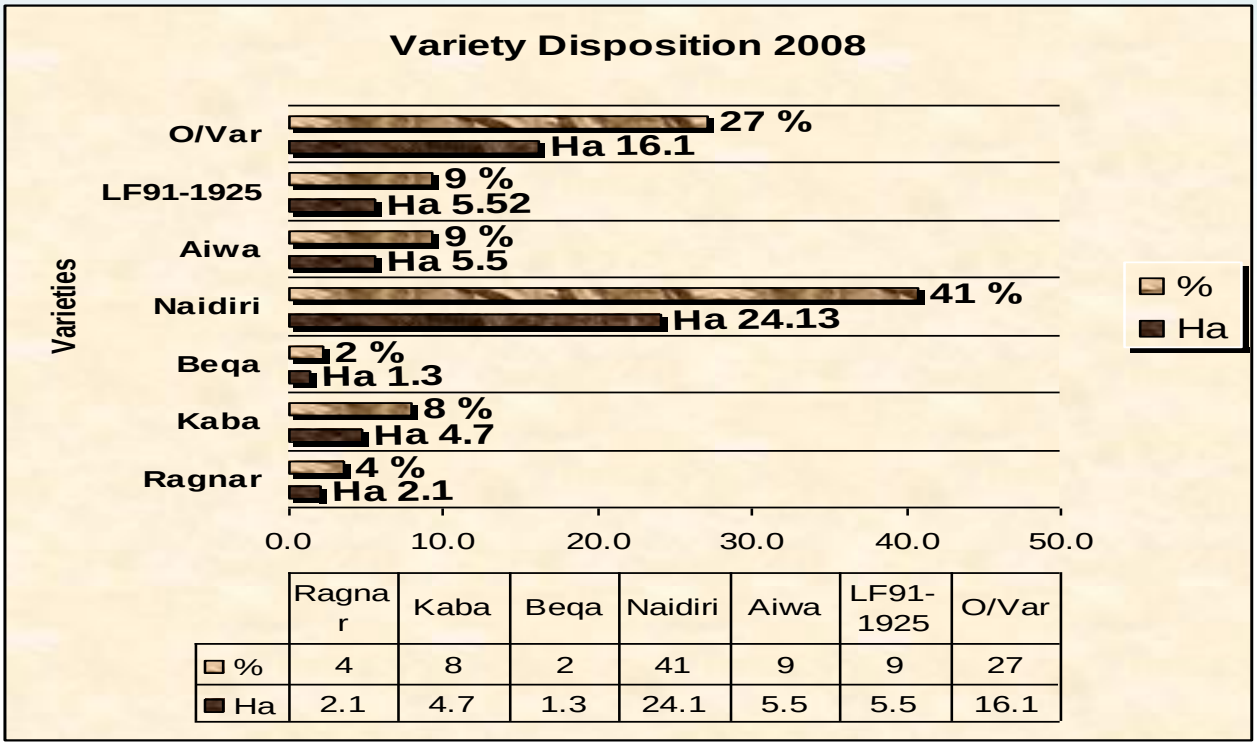


Table 2.0: Production for the past nine years.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
AUC (ha)	48.4	58.4	61.5	61.2	55	57.9	61.3	56.6	57.2
Production (t)	2528	2722	6331	4242	4277	4256	5744	4147	4150
Yield (tpha)	52.2	46.6	103	69.3	77.8	73.5	93.7	73.3	72.5

This Estate has potential of achieving cane yield of 100-120 tpha. To achieve this, best management practices have been put to practice with timely operations, replanting and planting of old uneconomical ratoons. However the cost of production increased due to the rise in material and hires of services costs and weed control influenced by rainy weather. Other crucial elements such as drainage and damage of stubbles by mechanical harvesters, rejected cane and loss of cane due to poor operations will be monitored next season to minimize the effect on production.

Figure 2.0 Varietal composition and disposition – Nadi Estate 2007.



	Ragnar	Kaba	Beqa	Naidiri	Aiwa	LF91-1925	O/Var
%	4	8	2	41	9	9	27
Ha	2.1	4.7	1.3	24.1	5.5	5.5	16.1

Rarawai Estate

Cane Production in 2008 Season

Total production (tonnes)	Total Area(ha)	Tonnes cane /ha	Tonnes Burnt/green	
4400	74.5	59	2206	2194

The increase in burnt cane penalties is due to frequent breakdown of the mill in the beginning of the season which resulted in high burnt cane later in the season.

In order to increase the yield, a total of 14 ha have been planted. The plant crop was irrigated to ensure good germination .Timely cultivation was carried out in all the fields to reduce weeds .Chemical and manual weed control was also carried out in most of the fields .Fertilizer was applied as per fertilizer recommendations on the basis of soil analysis results. Drainage was improved in the fields which had water logging.

At the close of the financial year for 2008 the production cost was reduced to $28/t. Further reduction in production cost could have been done if the harvesting was not affected by poor factory performance.

Penang Estate

The Penang Estate has a land area of approximately 4.1ha which is the smallest of our estates.

The estate has the capacity of producing above 400 tons of cane i.e. 100 tons per hectare if there is favorable weather condition. During the 2008 harvesting season 336.60 tons of cane was harvested while 19 tons of cane was harvested for seed cane sold to the farmers. In total 355.60 tons of cane was harvested from Penang estate with a yield of 88.9 tons per hectare

All cane was harvested green and trash was maintained throughout the estate farm. Trash retention had effectively controlled the re- immergence of itch grass and reduced a major cost in weed control.

Flooding of the fields as a result of the cyclones had a disastrous effect on the yields during the rainy season.

Labasa Estate

Labasa estate has 38.0 ha total area available for cane planting and has a farm basic allotment of 3125 tonnes. All estate land is been used for commercial cane farming. The estate land is very flat and low lying. A total of 2807.4 mm of rainfall was received in 2008. Very similar rainfall was also recorded last year. Continued rain and flash flooding during the first quarter of the year together with three cyclones hindered fertilization, weeding and rest of the cultivation work.

As the result of flooding gaps in the fields are visible thus giving lower yields to our crops. Cultivation work was mostly done by machine. Integrated system of weed control was also practiced. The amount of nutrients applied to a hectare of cane was 120 kg N, 22kg P, and 90 kg K.

Total production for the estate was 1232 tonnes of cane with a yield of 54.0 tpha, which was all time low since the institute took over the estate in 2003 due three cyclones, flooding, wet fields, leaching of fertilizer and late harvesting since we did not have any contractor to harvest the cane.

Four thousand meters of drains was dug that was year marked for cleaning and deepening.

Table Production history for last five years

Year	Area	Tonnes	Yield (tpha)
2004	25.0	1573	62.9
2005	36.2	3210	88.8
2006	29.4	1914	65.0
2007	33.6	2285	68.0
2008	22.8	1232	54.0

SUGAR RESEARCH INSTITUTE OF FIJI

CORPORATE INFORMATION

Mail Address
P.O.Box 3560
Lautoka, Fiji Islands

Telephone : (679) 666 1839
Facsimile : (679) 666 1082

Bankers
Westpac Banking Corporation
Lautoka, Fiji Islands

Solicitors
Yash Law
Lautoka, Fiji Islands

Auditors
KPMG
Lautoka, Fiji Islands

e-mail: info@srif.org.fj