2007 Annual Report

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MISSION STATEMENT

Advancing Industry by Excellence in Research to Improve Productivity

SUGAR RESEARCH INSTITUTE OF FIJI PROFILE

Our Organization

Research for sugar cane began with a small entomology laboratory in Nausori in the 1890's by the Colonial Sugar Refinery Company, which was transferred to Rarawai in 1900. This laboratory was established as the Agricultural Experimental Station in 1904 when it began the breeding program. It was relocated to Lautoka in 1958 and was renamed as Sugar Cane Research Centre in 1982.

Later in 2006, the government established an independent institute for the purposes of promoting, by means of research and investigation, the technical advancement, efficiency and productivity of the Sugar industry, and to provide its functions, powers, administration and finance and for related matters as per the SRIF Act 2005.

Our Business

The principle objective of the Institute is to breed and release high yielding disease resistant cane varieties suited to the Fijian soil types. Other areas of research at the Institute include detection and control of pests and diseases in cane fields, screening of new varieties for resistance to disease, determination of nutritional requirements of cane, and the use and effect of herbicides/pesticides on weeds/pests and on cane. The Institute also offers various services to growers which include soil and leaf analysis for the preparation of fertilizer recommendation through Fertilizer Advisory Service, cane analysis for sucrose content and specialist advisory service for soil conservation, drainage, fertilizer advice, weed control and new farm development. Adoption of sound farm management practices is ensured by the Institute through improvement of communication between research staff and growers via extension services which has been re-established.

STAFF LISTING: 2006 – 2007

MANAGEMENT STAFF

STAFF

Hemraj Mangal - Office-In-Charge / Manager Extension Services
Sanjay N Prakash - Finance & Administration Manager
Rupeni Tamanikaiyaroi - Research Officer
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
Ranjeeta D 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

CLERKS AND SUPERVISORS

Meena Nair – Administrative Assistant
Samuel Work - Technical Field Assistant
Abdul Kadir - Technical Field 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, Ilaitia Selabuco, Manoj Dutt, Vijay Dutt, Shalend Naidu, Avinesh Sami, Isireli Qio, Ramesh Chand, Anand Roy, Surindar Singh, Ami Chand, Kamal Nabi, Ashwin Prasad, Govind Sami, Marika, Ram Sami, Chandar Segran Pillay, Semesa Navara, Raja Ram, Serevi Nauvi, Krishan Chandra, Log Nadan, Mosese Turaga, Rahimat Ali, Rajendra Prasad, Rohil Datt Ram, Subhash Chand, Aporosa Rageci

ESTABLISHMENT/SECURITY

Jai Ram Mudaliar, Shiu Nadan, Tarun Sami, Ram Kumar, Aporosa Rasavul

OFFICER-IN-CHARGE'S REPORT

In 2007 the Fiji Sugar Industry continued on its downward spiral. A crop of only 2.48 million metric tons of cane was harvested from an area of 52558 hectares and 0.237 million tons of sugar was produced. There was decline in cane yield from 58 tons per hectare in 2006 to 47 tons per hectare in 2007. The total number of sugar cane growers and total farm basic allotment with registered area remained basically unchanged in comparison to 2006. The cultivated area and area harvested declined by 3460 and 2880 respectively in 2007 season compared to the previous season.

With the inception of the Institute in late 2006, a lean extension service was established commencing in April 2007. It envisions improving communication between researches and farming sector. The institute in 2007 continued its program on to breed and release high yielding disease resistant cane varieties suited to the Fijian soil types. The program also included investigation and study of nutrient management, soil & water management, cultural operations, mechanized harvesting, cane deterioration, fertilizer advisory services and meteorology. Other areas of research included detection and control of pests and diseases in cane fields, screening of new varieties for resistance to disease and the use and effect of herbicides/pesticides on weeds/pests and on cane.

The agronomic studies conducted during the year at three separate locations in cane belt confirmed that incorporation of *Ca-silicate* into the soil prior to planting increases sugarcane yield on poor and medium fertility soils. At Seaqaqa (Vanua Levu) on talasiga soil (literally 'sun burnt') a 20% increase in sugarcane yield was evident where the rate of *Ca-silicate* application was 9 t/ha. The other achievement reported by the researchers during the year; high percentage of clones were resistant (74%) compared with 23% were moderate and 3% were susceptible to Downy mildew in the trials this year. During the year, 899 bi-parental crosses were set-up using 217 female and 206 male parents. A total of 10784 varieties, from the LF2007 series, which was 89% of the total potted were transplanted as single stools. In view of the industry actively pursuing cogeneration of electricity a total of 18 high fibre (HF) varieties had been identified from progressive stage 3 and 4 trials. The fibre percent of these varieties ranges from 12.4 to 16.5 % based on small mill samples. Furthermore, the analytical laboratory of the Institute has well established internal quality control/assurance system. The Institute has joined with members of SPACNET for accreditation of our laboratory to international standards.

The European Union has announced reduction in Protocol Sugar Price of 36% by 2009 of which 14.3% reduction has already been effected. With the downward movement of the production and productivity of the Fiji Sugar Industry it is imperative that a strong extension service is set up. Without the necessary motivational and technical support to the farming sector the much needed improvement is not possible. The industry stakeholders have to rethink to empower and provide necessary support to extension service. In its current form, it is greatly constrained to achieve desired results.

Hemraj Mangal
Officer-in-Charge

CROP MANAGEMENT

The information derived from the section's diverse research projects will assist the industry in improving productivity, profitability and sustainability of sugarcane production.

The program focuses on nutrient management, soil & water management, cultural operations, mechanized harvesting, weed management, green cane trash blanket, agronomic & maturity pattern of test clones, cane deterioration, fertilizer advisory services and meteorology.

Fertilizer Management

Bio compost & mineral fertilizer

It is widely accepted that bio-fertilizers are more effective than mineral fertilizers in sugarcane production. This has led to formulation of new blends of mineral fertilizer together with factory and distillery waste mainly due to rise in the cost of imported raw materials. The study conducted by researchers in 90s have shown that mill mud and ash are both effective in increasing sugarcane yield. In relation to soil quality and sustainability of sugarcane production, bio-fertilizers have the advantage that they cause less acidity and improve the nutrient status of the soil better than mineral fertilizers.

Calcium silicate slag

In the soil, Silica (Si) is generally abundant as mineral quartz and clays, but its concentration in a soluble form is highly variable. Soluble Si increases the plants' resistance against attack by insects and diseases, and improves plant tolerance to water stress. Studies have shown that increasing silica content in soil can result in increased P uptake by plants and decrease the soil concentration of some toxic elements.

The study conducted at Seaqaqa, Legalega and Drasa Estate illustrated that incorporation of *Ca-silicate* into the soil prior to planting increased sugarcane yield on poor and medium fertility soils respectively. At Seaqaqa on talasiga soil (literally 'sun burnt') a 20% increase in sugarcane yield was evident where the rate of *Ca-silicate* application was 9 t/ha. At the other two sites the increase in sugarcane yield was moderate and ranged between 6-8% against the control plots where no silicate fertilizer was added.

K fertilizer

The demand for potassium by different crops varies to a large extent and sugarcane crop has a great requirement in comparison to most crops. Since sugarcane is a luxury consumer of K, substantial quantities of K are removed annually by the harvested cane. The K trial conducted at Penang was continued and further evaluated for fifth ratoon crop. The results indicate that potassium rates (0, 50, 100, 150, and 200) used in the study did not affect %pocs, cane and sugar yield. By differentiating the best-fit quadratic equation the calculated amount of potassium required to produce maximum cane yield in the fifth ratoon was 95 kg K/ha, equivalent to 19 bags/ha of Blend C (containing 10.8 % K) fertilizer to produce an economical yield on a medium fertility soil.

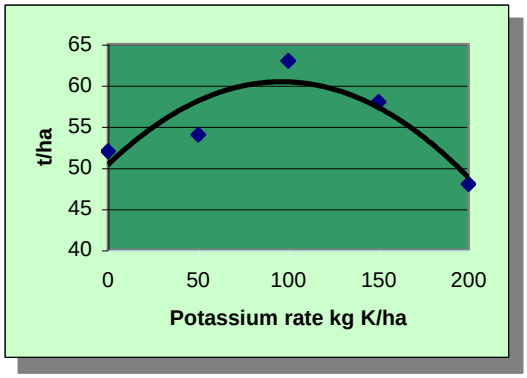


Figure 1. Effect K rates on cane yield *var.* Mana

Soil & Water Management

A total of 51% of the registered sugarcane land is located on undulating to hilly lands

(3-12^0 slopes). Unsustainable cane cultivation practices are responsible for declining sugarcane yields and valuable agricultural land annually going out of sugarcane production.

The study conducted at Rarawai on 8^0 slope was continued and evaluated for ratoon crop. The results indicate that due to the prolonged wet conditions that prevailed from December 06 to March 07, sugarcane yield reduced significantly ($P<0.05$) in the trash conserved plots. The trash cover during the wet period characterized by low evapo-transpiration and saturated root zone is likely to have affected the stalk population. In other words, where trash was removed soon after harvest growth was rapid in terms of number of tillers per stool and millable cane stalks as this was reflected in the cane yield data illustrated graphically in Figure 2. Conversely stalks in trash conserved plots were 13 cm taller but contained 28,000 less stalks/ha compared to plots where trash was removed after harvest. The growth measurement reading was taken at five months of crop age.

Table 1. Summary of conservation practices

Treatments
T1 – Cane planted across slope
T2 – Cane planted up/downhill
T3 – Cane planted across slope + vetiver hedgerow
T4 – Cane planted across slope + trash

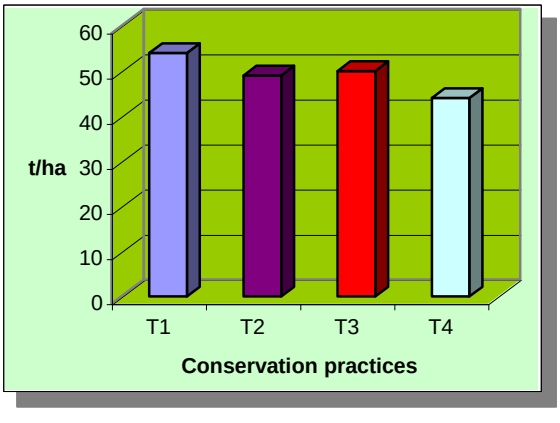


Figure 2. Effect of conservation practices on cane yield at Navoli, Veisaru sector

Cultural Operations

High Density Planting

The common row spacing used by growers in Fiji is 1.37m, which is equivalent to 4½ feet. This, over the years, has suited the tractor/trailer, portable line and lorry transport gangs in harvesting and haul outs. A new project was initiated in 2004 where cane was planted at high density using dual rows. The new method consists of pairs of cane rows 0.5m apart with 1.85m between their centres.

Dual row planting

The large strip trials conducted at Drasa Estate on Humic latosol using planting rate of 7 t/ha indicated that the adopted planting system encourages rapid canopy formation to maximize radiation interception and reduce weed growth. The new system showed that dual rows may be planted with same amount of seed cane used with the standard row spacing. The results also showed that additional fertilizer application per unit area is not warranted when planting dual rows. In addition to above, the total running meters available for planting as dual row increases to 10810m per hectare compared to 7299 running meters available at 1.37m spacing.

However, the system has shown some drawbacks especially using cane lorries in haul outs and lodging of varieties planted on raised beds namely Kaba, Aiwa, Mana and Naidiri. In future erect cane varieties that may not lodge easily should be considered for dual row planting. Currently the system is under evaluation before being recommended for commercial adoption in Fiji.

Hot Water Treatment

Based on the survey conducted by disease control unit hot water treated seed cane experiment was conducted at Drasa Estate. This experiment was carried out in conjunction with the Crop Protection division

in order to ascertain causes for declining sugarcane yield and to also provide quality seed material to growers.
The results from the experiments conducted at various locations on the main island, Viti Levu, provide evidence that seed materials are relatively free of any disease and the varying sugarcane yields could be due to the varietal characteristics and husbandry practices used on the farm. There was no real difference in yields between treated and untreated cane.

However, there were differences in yields between the sugarcane varieties investigated in the studies. The results also indicate that Mana, being a late germinating variety was affected by hot water treatment as the gaps were repeatedly filled due to poor germination at the initial planting. Such would be an expensive exercise for a grower especially considering the large area that *cv*. Mana occupies in the sugarcane belt.

Mechanization

Mechanized harvest
There were 15 harvesters in 2007 that operated in the three mill areas namely Lautoka, Rarawai and Labasa. The machines were exclusively owned and operated by private contractors but were governed by the Memorandum of Gang Agreement (MOGA) for harvesting and cartage of cane to the mills. In total 92,341 t of cane was cut compared to 136,527 t cut in 2006 season due to smaller crop and decrease in the number of harvesters in operation. The rise in fuel prices over the 12 month period also impacted the operation process.

Cane losses – mechanized harvesting
Preliminary investigation results provide evidence that cane losses up to 6-10 t/ha occurred during green cane harvesting. This was mainly extractor-fan losses. Extractor fan losses result from the fan operating at a high speed usually greater than recommended speed of 1100 rpm. The reason being is that many of the operators did not use their topper-blade to cut off the cane tops to reduce the trash content passing out through the extractor fan.

Figure 3. Track harvester in operation at Drasa Estate

Figure 4. Cane losses resulting from harvester operations

Figure 5. Irregular and damaged billets caused by poor harvester operations.

Analytical Laboratory

1. Introduction

The Analytical Laboratory continues to provide essential analytical services to growers and other research sections. Soil and leaf samples are mostly analyzed for macronutrients for blended fertilizer recommendations and to determine the status of each nutrient in the sample. Cane samples are mainly analyzed to determine %pocs and % fibre for research trials conducted by the respective sections in the four mill area.

The laboratory carries out soil salinity & sodicity assessment, cation exchange capacity, soil texture, organic matter, total nitrogen & phosphorus and micronutrients analysis upon request. Depending on the availability of chemicals, instrument and methodology, the laboratory can carry out other non-routine analysis such as cane deterioration analysis and etc which are of interest to the agricultural industry.

2. Soil and Leaf Samples

A total of 1675 soil and leaf were analyzed for advisory and research purposes. Out of which 835 samples were for Fertilizer Advisory Services (FAS) for plant and ratoon recommendation. The number of soil and leaf samples received and analyzed for year 2007 is shown in the Table 1.

Table 1: Total number of Soil and Leaf Samples analyzed in 2007

District	Soil		Total	Leaf		Total	Grand Total
	Advisory	Research		Advisory	Research		
Lautoka	337	109	446	*	254	254	700
Rarawai	196	170	366	54	76	130	496
Labasa	183	112	295	*	*	*	295
Penang	65	99	164	*	20	20	184
Total	781	490	1271	54	350	404	1675

There was a slight increase in the number of soil samples received for FAS. This was due to the recruitment of thirteen new extension personnel in April. Only a small proportion of cane farmers in Fiji use FAS. This could be due to expiring land leases and other unknown reasons. It is anticipated that more farmers will seek the services of FAS as they become more aware of its benefit. Hence an educational program is needed to be conducted especially on soil and leaf sampling by the new extension officers together with the research personnel, since fertilizer usage is a major expense of growers.

3. Cane samples

A total of 3276 cane samples were analyzed for brix, pol, and fibre to determine %pocs in the small mill. The cane samples consist of variety, disease and agronomy trials conducted in the three mill areas (Lautoka, Rarawai & Penang).

The cane analysis for trials in Labasa is carried out by the Staff Officer based there. The number of cane samples analyzed for the respective sections are shown in Table 2 below.

Table 2: Number of Cane Samples 2007.

Quarter	Trials		
	Agronomy	Disease	Variety
2nd quarter	114	*	497
3rd quarter	593	*	1922
4th quarter	114	36	*
Total	821	36	2419

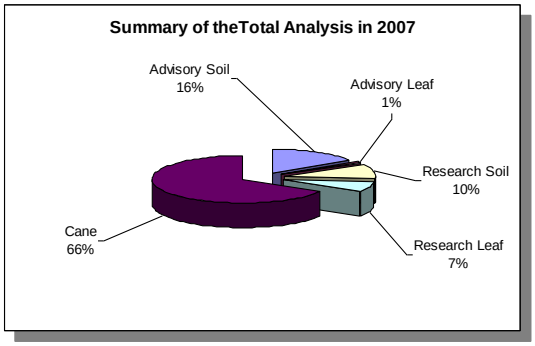
4. Quality Assurance System

Our internal quality control program is well established due to set up of quality assurance program with members of SPACNET for accreditation of our laboratory to international standards.

The analytical laboratory renewed its membership to the Australasian Soil and Plant Analysis Council exchange sample proficiency under SPACNET funding this year. After the three sets of leaf and soil sample results were assessed and validated. The analytical laboratory was certified for leaf potassium analysis only. Due to

technical problems faced with the instrumentation, the laboratory could not submit results for most of the samples. This will be the second year; the laboratory is participating in the ASPAC proficiency program under SPACNET funding. The results obtained have improved after understanding the type of samples and different methods of analysis required to carry out especially in the case of alkaline soils.

The Analytical laboratory is involved with the university student's master thesis project where aerosol samples are taken on weekly basis to analyze for nutrients lost to the atmosphere.



Meteorology Report 2007

Introduction

The Meteorology Station in Sugar Research Institute of Fiji (SRIF) is maintained with the help of the Fiji Meteorology Services (FMS). The weather 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 four districts are compiled and also forwarded to Fiji Meteorology Services.

Currently there are 42 FSC rainfall stations which collect rainfall data daily while the weather stations in the four mills are looked after by the research staffs based there.

Rainfall

January was significantly suppressed across the country as moderate El Nino event continued to affect the region. Below average to well below average rainfall was recorded. Due to the passage of a tropical depression and active troughs of low pressure system over Fiji, average to above average rainfall was recorded in cane belt in February. There were reports of severe flooding and landslides in Labasa whereas flooding in Nadi.

Majority of the sites recorded above average rainfall in March. March was wet as active troughs of low pressure persisted over Fiji. There were reports of flooding in Labasa, Nadi, Rakiraki and Tavua with minor damages. Major impact seems to be on roads. Rainfall varied considerably across the country in April. Two significant troughs of low pressure system and tropical Cyclone Cliff brought significant heavy rainfall in parts of Viti and Vanua Levu. Almost all the cyclones (*Arthur, Zita, Becky and Cliff*) formed in the South West Pacific region caused no direct threat to Fiji groups.

Fiji experience typical transition month weather pattern where western and the southern part of the country were largely influenced by sub-tropical high pressure system resulting in drier and cooler than normal conditions. Extensive flowering has been observed this year. Most of the western division received below average to well below average rainfall with driest part being around Rarawai. June was relatively dry in most parts of the country. The sub-tropical high pressure system and associated ridges were the main features influencing Fiji's weather in June. Well below average rainfall was recorded in the western division while the northern division recorded below average rainfall.

Four rain bearing weather system passed over or close to Fiji in July resulting in average to well above average rainfall being recorded in parts of the country. However, rainfall was not widespread and parts of western and northern division recorded

below average rainfall. July was the warmest in 50 years in Fiji this year. Rainfall varied considerably across the country in August. Well below average rainfall and above average sunshine hours were recorded in the parts of western division. In contrast average rainfall was received in Vanua Levu. Rainfall analysis by FMS showed that a drought on an agricultural time-scale existed in western and northwest Viti Levu. Northern part of Viti Levu also experienced below average surface and subsurface water level. A brochure for drought monitoring was also issued by Fiji Meteorological Services.

September was exceptionally wet with all sites recording above to well above average rainfall. The high rainfall was due to the dominant influence of slow moving troughs of low pressure and associated moist east to north east wind flow. The agricultural drought no longer existed and disappeared with continuing rainfall in the coming months. October was wetter than normal in most part of the country. Rainfall ranged from average to well above average (except for Penang Mill) in October. This was the dominant effect of the South Pacific Convergence Zone.

Wetter than normal conditions continued in November as SPCZ and slow moving trough of low pressure affected the country most of the time. The enhanced convective and rainfall activity resulted in average to above average rainfall across most parts of the country. Overall average to well above average rainfall was received across the country in December. Tropical Cyclone Daman passed through the Fiji Waters. There was little damage on the main islands apart from landslides and flooding in the northern part of northern division and parts of Viti Levu.

The moderate El Nino event which established by December 2006, persisted early 2007. It gradually weakened and dissipated in the coming months. Neutral conditions generally affected the region from February onwards till August with the possibility of La Nina conditions emerging later during the year. There was little chance of returning to El Nino conditions in 2007. By July the chances of La Nina developing in the coming months increased. A borderline La Nina event existed in August. In September, a weak La Nina event existed and it strengthen further into a moderate event by December. In December, it firmly established in the Pacific Ocean and atmosphere and likely to mature in early 2008.

Lautoka

The El Nino event of 2006 persisted during the month of January as well below average rainfall was recorded at Lautoka Mill. Lautoka mill recorded well above average rainfall for month of February till April.

May was drier and cooler than usual as below average rainfall was recorded after continues three months of rainfall. Hardly any rainfall was recorded for the month of June as drought like conditions mostly prevailed. Normal conditions prevailed during month of July but were not enough to replenish the soil moisture. Favorable conditions existed for harvesting and transportation of cane to the mill. Drought like conditions continued in August as well below average rainfall was recorded. Some areas there were reports of small creeks drying out.

September was exceptionally wetter than usual as well above average rainfall was recorded, relinquishing the soil moisture status during the replanting season. As the La Nina event strengthen during the later part of the year, above average to well above average rainfall was recorded during the fourth quarter near Lautoka Mill. Lautoka Mill recorded above average rainfall for year 2007.

While the amount of rainfall recorded by the sectors varied, similar conditions prevailed. There was no reading available for Qeleloa sector for the month of March till September and similarly for Natadola area for year 2007.

Rarawai

Similar conditions prevailed like Lautoka Mill during the first quarter at Rarawai Mill. Unlike Lautoka Mill, Rarawai Mill recorded below average rainfall for the month of April.

Well below average rainfall was recorded for the month of May and June. When compared to other three mills, mostly dry conditions prevailed in most of areas around Rarawai Mill from April to June. Despite Rarawai mill recorded well above average rainfall for the month of July, it was not enough to relinquish the soil moisture. Drought like conditions mostly prevailed in the area as well below average rainfall was recorded for the month of August.

Like the rest of the mills, Rarawai recorded well above average rainfall for the month of September. Rarawai Mill area continued to receive average to above average rainfall during the fourth quarter due to the moderate La Nina event. Rarawai mill recorded above average rainfall for year 2007 while there was slight even distribution of rainfall throughout the year. Similar conditions existed at the sectors also.

Labasa

Labasa Mill recorded above average rainfall for year 2007 but the rainfall distribution was evenly distributed when compared to the other three mills. The mill recorded well below average rainfall for the month of January only.

Above average to well above average rainfall was recorded during the following period from February to March and September to December. Unlike the western division, normal conditions mostly prevailed from April to August. Except for the month of April and July where the mill recorded below average rainfall. The rest of the period it recorded average rainfall. Soil moisture status was better in the northern division when compared to drought like conditions that existing in areas around Lautoka and Rarawai Mill during May to August. Similar conditions prevailed in sectors in Vanua Levu. No rainfall reading was available from Vunivutu for the month of December.

Penang

Due to persisting El Nino event in the beginning of the year, Penang Mill recorded well below average rainfall for the month of January. Penang Mill received average rainfall for the month of February while above average rainfall for month of March. Except for Lautoka Mill, Penang Mill recorded below average rainfall in April like the other two mills

From May to August, the mill continued to receive well below average to below average rainfall. Like areas around Rarawai Mill, drought like conditions mostly prevailed near Penang Mill.

From September onwards, the mill received well above average rainfall till December except for the month of October where unlike the other mills, Penang Mill recorded well below average rainfall. Except of Ellington II similar conditions mostly prevailed at Nanuku and Malau sector. Rainfall readings for the month of December were not available for Ellington II.

Relative Humidity

Average (%) relative humidity was recorded in first quarter except for the month of January. In January it was generally dry with long hours of sunshine and above average pan evaporation was recorded. Relative humidity varied across the country (sectors) from below average to average readings been recorded.

Most of the sites recorded below average relative humidity for the month of May to August. An average of seven units below the long term mean (LTM) relative humidity was recorded for these months at the Research Centre. Drought like conditions mostly prevailed during these months. From September till December, average to above average relative humidity was recorded

across the country as the La Nina event strengthens.

Sunshine

The monthly average sunshine hours were well above average for the month of January. Mostly wet and cloudy conditions prevailed from February to April, below average sunshine hours were recorded.

Relatively dry and fine conditions prevailed from May to August as above average sunshine hours were recorded except for the month of July. Sunshine hours varied from September to December. The length of sunshine hours varied during the month but overall mostly average to below average sunshine hours were recorded. Due to the emerging La Nina event mostly wet and cloudy conditions prevailed.

Earth Temperature

Earth thermometers recorded temperatures at the depth of 5cm, 10cm, 20cm and 100cm The research site at Labasa Mill also have earth thermometers which take temperature readings but at different depths. There are no earth thermometers currently at Rarawai and Penang Mill.

Above LTM earth temperatures were recorded at all the depths from January to October except for 5cm depth in May. The earth temperatures varied during November and December at different depths. The 20cm earth thermometer was damaged in November; hence there was no reading available for the month of November and December.

Soil Moisture

The Transeau ratio calculated for soil moisture status indicated that very dry limiting moisture status continued to exist in beginning of the year due to the El Nino event. As the El Nino subsided in February there was sufficient moisture for good growth for the month of February and March as above average rainfall was been recorded. Similar conditions prevailed in the Northern division.

The Transeau ratio calculated for soil moisture status indicated there was sufficient moisture for moderate plant growth in April around Lautoka Mill area while moisture status varied for the other mills. Drought to very dry limiting moisture status existed from May to August indicating slow growth of ratoon crops for the following year in the western division, while the moisture status near Labasa Mill were better.

The soil moisture status improved from September onwards due to above average rainfall been recorded till December. There were reports of water logging into the fields at times due to poor drainage, too much rain and other reasons. Similar soil moisture status existed near all the four mills as well as the sectors from September to December.

Air Temperature

The monthly mean maximum temperature was mostly average to above average throughout the year across the country except for the month of February, March and December where it was lower by 0.3-0.5^{o}C. The monthly day-time temperature was higher than the LTM for the rest of the months by 0.1-1.5^{o}C. The month of July was the warmest in 50years in Fiji according to Fiji Meteorological Services.

The monthly mean minimum temperature was mostly average to above average throughout the year across the country except for the month of January, May and December where it was slightly below average by 0.1-0.3^{o}C. Month of May was drier and cooler than normal. The lowest night time temperature of 16.8^{o}C was recorded in May while the highest day time temperature was recorded in January, 34.8^{o}C.

Evaporation

The sunken and raised pan evaporation was above average in January and from May to August. Mostly dry conditions prevailed during these months.

Below average raised and sunken pan evaporation was recorded during the rest of the year as mostly wet and cloudily conditions prevailed at the time.

Workshop

The Fiji Meteorological Services organized a workshop for the FSC Field Personnel and growers on application of climate predication in December. The purpose of the workshop was to make people aware about climate forecast and it application in various fields such as agriculture, tourism, forestry, hydrology, fishery and other industries.

Table 1: Rainfall (mm) for all mills - 2007

Mills	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Lautoka Mill													
Monthly Rainfall	60.9	438.5	674.1	223.5	41.9	0.5	48.8	21.6	201.8	111.4	268.0	271.7	**2362.7**
No. of rain days	11	17	25	16	8	1	6	5	16	10	16	18	**149**
98 years average	294.6	317.3	313.8	182.9	97.2	64.6	49.5	70.6	70.3	89.6	123.1	189.7	**1863.2**
% of average	20.7	138.2	214.8	122.2	43.1	0.8	98.6	30.6	287.2	124.3	217.7	143.2	**126.8**
Rarawai Mill													
Monthly Rainfall	110.3	583.0	903.8	160.8	13.8	7.1	42.2	14.3	239.2	140.0	305.4	285.4	**2805.3**
No. of rain days	11	18	24	14	6	2	4	4	11	14	18	16	**142**
121 years average	347.4	355.3	361.2	296.0	77.0	35.6	27.8	99.9	103.3	147.1	221.9	239.4	**2311.8**
% of average	31.8	164.1	250.2	54.3	17.9	19.9	152.0	14.3	231.5	95.2	137.6	119.2	**121.3**
Penang Mill													
Monthly Rainfall	64.2	343.1	716.0	185.7	80.2	25.0	35.8	29.7	204.3	45.4	329.9	557.8	**2617.1**
No. of rain days	13	22	27	18	13	4	5	10	16	12	18	20	**178**
109 years average	425.2	349.0	412.5	389.2	120.4	68.6	52.0	93.4	85.0	146.6	149.5	238.2	**2529.5**
% of average	15.1	98.3	173.6	47.7	66.6	36.5	68.9	31.8	240.4	31.0	220.7	234.2	**103.5**
Labasa Mill													
Monthly Rainfall	99.5	458.2	619.0	166.9	101.4	55.5	29.5	48.7	327.2	131.0	310.4	438.9	**2786.2**
No. of rain days	10	22	27	16	9	8	4	8	18	17	21	21	**181**
117 years average	360.5	359.1	379.0	237.9	109.1	64.5	47.0	50.4	102.2	101.3	203.6	251.7	**2266.5**
% of average	27.6	127.6	163.3	70.1	92.9	86.0	62.7	96.6	320.1	129.3	152.4	174.3	**122.9**

Table 2. Transeau Ratio (Precipitation/Evaporation) and Moisture Status of Soil 2007

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

CROP PROTECTION

The main objective of the section is to minimize the economic losses caused by sugarcane diseases and pests in the sugar industry through vigilant inspections of farms against diseases; release of pest and disease resistant varieties of sugarcane; and adoption of appropriate pest and disease management practices by growers.

Diseases

There are 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 the recent most confirmed disease, ratoon stunting disease. 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. The insect pest, cane weevil borer (***Rhabdoscelus obscurus*** Boisd.) have caused economic loss over the years.

Downy mildew disease

The management of downy mildew disease has been attributed to planting a resistant sugar cane variety and the recommendation for planting a resistant maize variety, an alternate crop planted in the Sigatoka valley. The Disease Control Unit has contributed also in conducting vigorous rouging in these areas.

Figure 1: Downy mildew infected cane at the Tavakubu DOM nursery

Screening for resistance to Downy mildew disease was conducted at the downy mildew disease nursery at Tavakubu, Lautoka.

A total of 24 clones belonging to the LF03 were screened for downy mildew disease resistance. In the trial conducted, 50% of the clones did not germinate well to be considered for assessment. A high percentage of clones were susceptible (75%), compared with moderate (8%) and resistant clones (17%), as shown in Table 1.

Table 1: Resistance of clones screened for Downy mildew disease

Series /Number screened	Clone Resistance (%)		
	Resistant	Moderate	Susceptible
LF 03 / 12	17	8	75

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 (LF01 and LF02) were initiated in March at the SRIF Insectary in Lautoka. The results (Table 2) of the 74% of the LF01 and LF02 series were both resistant while 23% were moderate and 3% susceptible.

Table 2: Resistance of clones screened for Fiji leaf gall disease

Series /Number screened	Clone Resistance (%)		
	Resistant	Moderate	Susceptible
LF01/ 23	74	22	4
LF02 / 114	74	24	2

Ratoon stunting disease

Ratoon stunting disease as surveyed 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).

The screening for RSD resistance for 2007 did not eventuate as our trial was accidentally burnt before harvesting of samples were made

Cane weevil borer

Cane weevil borer (***Rhabdoscelus obscuras***, 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, CWB 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.

Table 3: CWB infestation on test clones screened for cane weevil borer and breeding cwb adults in insectary

Test clones	Length damaged	Number of larvae
LF96-626	5.3	0.7
LF96-651	20.3	2.7
LF96-1057	12.7	1.3
LF96-1127	3.3	0.7
LF00-491	13.7	1.7
LF00-504	17.7	2
LF00-257	8	1.3

From the experiment conducted, LF96-1057 was the most affected while LF00-257 was the least affected. 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 as shown in Table 3.

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 9763 hectares of cane were inspected for major diseases and pests of which 674 ha were plant and 9089 ha were ratoon (Table 4)

Table 4: Summary of inspections for all mills

	LAUTOKA		RARAWAI		LABASA		PENANG	
MONTH	PLT	RT	PLT	RT	PLT	RT	PLT	RT
JAN	9	233.9	0	0	63.7	172.2	22.5	86
FEB	2.6	278.7	4.6	78.4	42.9	128.9	6.8	126.7
MAR	8.8	402.1	0	47.6	75.8	269.4	4.2	101.7
APR	2.1	488.9	10.9	54.8	40.2	229.5	0	77.14
MAY	21	674.9	10.5	77.9	59.6	227.7	3.7	100.9
JUN	11.7	643.2	6.3	30.6	78.7	42.4	0	59.5
JUL	18	646.1	1.4	22.9	0	18.7	2.1	43.7
AUG	28.7	705.6	5.1	137.5	4.9	92.1	1	94.9
SEP	10.7	508.2	10.8	101.5	0	24.8	13.2	108
OCT	12.2	417.2	1	127.9	15.9	144	8	140
NOV	1.7	343.8	6.9	83.1	23.3	145.4	0	144.1
DEC	5.8	230.4	0	38.1	14.2	125.5	3.6	12.2
TOTAL	132.3	5573	57.5	800.3	419.2	1620.6	65.1	1094.8
Mth mean		475.4		71.5		170.0		96.7
Av area/person /mth		47.5		23.8		21.2		32.2

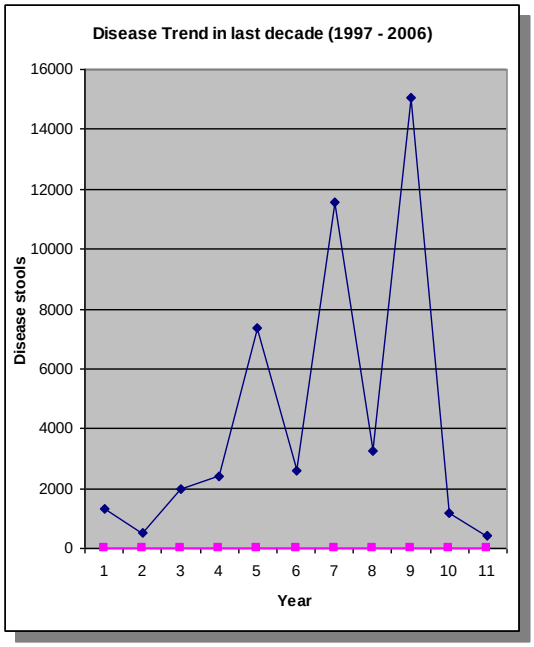
The performance of the Disease Control Unit in the Lautoka and Penang mill area was encouraging but for Labasa and Rarawai was hampered due to the unavailability of their vehicle.

The increasing trend of Fiji leaf gall disease in the cane farms is an indication that the disease can flare up at any time given the availability of the pathogen; the suitable weather conditions and; the large amount of the intermediately susceptible. Another reason may be that the historically infected farms were not checked because all the other farms were not inspected during the previous year.

The continuous inspection and rouging by the Disease Control Unit, availability and planting of clean seed material are paramount to keeping pest and diseases in check. Infected farms are quarantined within one kilometre radius area and all farms were inspected within this quarantined area when either Fiji leaf gall or downy mildew disease is found. The presence of ***Sacchrum edule,*** an alternate host of Fiji leaf gall disease planted along side the cane field contributes as a source of virus if it is infected.

FLG disease stools were removed from Natova sector in the Lautoka district while Legalega, Meigunyah, Malolo, Yako and Nawaicoba sectors in the Nadi district and Lomawai sector from the Sigatoka district were affected. The Lautoka mill district had 1322 stools rouged out and only eight stools infected with FLG was rouged from Rarawai sector in the Rarawai mill district.

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.



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
LF95	39504	1297	300	55	7
LF96	25614	1708	355	39	8
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		
LF06	11555	606			
LF07	10784				

Flowering Beds

There were four flowering beds that produced flowers for crossing in 2007. The number of varieties in the arrowing beds for the 2007 crossing season was 685.

Crossing

The 2007 crossing season commenced on 16th May and ended on 28th June. 899 bi-parental crosses were set-up using 217 female and 206 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 574 packets of fuzz was sown that included fuzz from the past five years. 134 packets germinated (23 %) and produced 12165 seedlings.

Figure 1: Seedling raising

Stage 1 Trial

Planting

A total of 10784 varieties, from the LF2007 series, which was 89% of the total potted (12165) were transplanted in an area of 1.3 hectare as single stools. The seedlings were irrigated and established well.

Selection

A total of 606 cultivars of LF 2006 series were advanced from stage 1 single stool clones to stage 2 single lines. The selection percentage was 5.2 % of the 11555 clones from stage 1. The selection was done 10 months after planting and was based on brix, vigour and disease incidence.

Table 1: Brix range for selected varieties and standards

Selection Range (Brix)	≥ 25.0	24≤24.9	23≤23.9	22≤22.9	≤ 22	Total
No of varieties Selected	5	88	217	205	96	606

Figure 2: Stage 1 Planting

Stage 2 Trial

Preliminary selection (brixing) was carried out at the end of July and the final small mill sampling 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 149 varieties has been selected and advanced to stage 3 observation plot trial. The sucrose content of the selected varieties ranged between 8.1 – 16.4 %. The sucrose content of 107 varieties was better than the best standard variety Naidiri. The fibre content of the selected varieties ranged between 8.8 – 16.7%. There were 24 varieties that have fibre content greater than 14%.

Stage 3 Trial

The small mill sampling was done on 6th August 2007. The final selection of varieties was based on comparison of test clones data against the standards and also the field information that was recorded during sampling. 39 varieties were selected on sucrose content and % fibre and advanced to stage 4 seedbed. The sucrose content of the selected varieties ranged between 13.3 – 17.5 % and the standards from 13.6 – 16.1%.

Development of high fibre varieties

There are 18 high fibre (HF) varieties that have been identified from progressive stage 3 and 4 trials. The fibre percent of these varieties ranges from 12.4 to 16.5 % which is based on small mill samples that comprise of 6-9 stalks and the crop age would be 12-13 months old. The actual fibre percent may vary in large mill.

The promising varieties from the above will be identified after the completion of respective trials and further propagated with a view to conducting mill trials to ascertain their commercial potential. One HF variety LF97-382 has been propagated in a large plot and a large mill trial will be planted in 2008. The average cane yield of LF97-382 in the small plot trials was 140t/ha, sugar yield was 18t/ha and fibre content was 13%. The trial results are from small plots and the commercial production potential needs to be ascertained by conducting the LMT.

Stage 4 Trial

The following series were analysed for the stage 4 trial; LF99 (2nd ratoon), LF00 (plant) LF01 (plant). The tables below show the summarized data of selected varieties for advancement from all trial locations.

Table 2: LF99 Summary

Variety	% pocs	% fibre	tc/ha	ts/ha
LF99-1592	15.4	11.8	75	11.3
LF99-972	13.6	13.1	76	10.3
Ragnar	15.3	11.0	86	13.1
Naidiri	15.2	11.2	80	12.1
Aiwa	15.6	11.3	74	11.3
Mana	13.7	9.2	82	11.1
Beqa	15.9	12.1	68	10.8

LF99-1126 & LF99-1254 have also been marked for advancement.

Table 3: LF00 Summary

Variety	% pocs	% fibre	tc/ha	ts/ha
LF00-491	15.0	12.7	137	20.1
LF00-260	15.0	13.3	123	18.1
LF00-261	15.1	12.8	118	17.7
LF00-631	14.1	10.2	124	17.4
LF00-257	15.8	11.7	112	17.4
LF00-1057	13.8	11.4	124	17.2
Aiwa	14.7	10.2	111	16.3
Mana	13.8	8.9	118	16.2
Naidiri	14.8	10.5	99	14.2
Beqa	15.6	11.8	91	14.0
Ragnar	14.2	10.0	93	13.0

Table 4: LF01 Summary

Variety	% pocs	% fibre	tc/ha	ts/ha
LF01-133	13.2	8.8	130	16. 4
LF01-90	14.2	10.4	134	19.4
LF01-278	12.2	12.7	144	19.0
LF01-443	13.0	11.2	144	18.6
LF01-384	14.2	11.1	129	18.4
LF01-406	13.4	10.5	130	18.0
LF01-409	13.2	9.0	131	17.4
LF01-130	12.7	11.2	138	17.0
LF01-276	14.4	12.3	121	17.0
LF01-466	12.1	11.8	128	15.4
LF01-480	12.7	13.0	123	15.4
LF01-159	14.5	11.8	107	15.3
LF01-101	13.1	13.3	103	13.0
Naidiri	14.6	10.0	144	20.7
Aiwa	15.3	9.3	118	18.0
Ragnar	13.7	9.3	118	15.7

Stage 5 Trial

The following series were analysed for stage 5 trial; LF97 (plant) & LF98 (plant). Varieties selected from this stage would be considered for release by the science audit committee.

Table 5: LF97 series

Variety	% pocs	% fibre	tc/ha	ts/ha
LF97-958	15.0	11.8	104	15.3
Mana	13.6	9.4	117	15.4
Naidiri	15.7	10.4	97	15.0
Beqa	16.8	11.5	88	14.5

The LF97 series had only one major variety that showed potential. This variety would be selected for propagation and further testing in a strip trial.

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

As for the LF98 series, at least four varieties have been selected for strip trial. Two varieties have performed much better than the best commercial variety in terms of fibre and cane tonnage but not %pocs.

Table 6: LF98 series

Variety	% pocs	% fibre	tc/ha	ts/ha
LF98-1116	14.5	11.2	104	15.3
LF98-1175	14.7	10.5	110	15.9
LF98-1177	16.1	10.7	86	13.9
LF98-419	15.5	11.8	96	14.7
Naidiri	15.1	10.5	100	15.1
Mana	12.6	8.8	109	13.1
Beqa	16.1	11.5	108	17.5

Once approved by the science audit committee then these selected varieties would be propagated in a strip trial possibly in 2008 or 2009.

Figure 3: Flower for Crossing from the Dobuilevu Flowering Bed

ESTATE

The Institute manages all four estates (Waqadra, Drasa, Rarawai & Labasa) producing over 18,000 tonnes of cane with an average yield of 72.2t/ha. Total available area (all estates) – 329.1 ha, 20 % short fallow – 66.0 ha, Total AUC – 263.1 ha. We have improved the total production compared to previous years and we have reduced our production costs from $50/t (2003) to $30/t (2005). Efforts are been undertaken to reduce it further to $25/t with the implementation of best management practices. Increasing inflation and the decreasing power of local currency over the years has put major constraints on the estate cost. Every effort is being made to curb down these costs to acceptable levels. However, unless harvesting cost is reduced, it is almost impossible to make major reduction in cost of production. With the declining sugar prices and diminishing profits due to fluctuations in world market prices for this commodity, compounded with escalating production costs, a business like attitude towards sugarcane farming is needed to remain competitive in the international arena. This can only be achieved through appropriate research and investment in the estates with mechanization and modern farming systems to reduce costs and realize optimum profit margin. Arson is still a major problem and an added cost factor to the business of sugarcane.

It is important to realize that mechanization is essential as this will ultimately reduce the cost of production. As a result, estates will be able to finance its own activities and will become a business centre. We will also be able to set up model farms and gear up for the role to indicate to the growers the benefit of best farming practices.

Table 1: Estate production for 2007

Estate	Total Production(tonnes)	Total Area(ha)	Tonnes Cane/Ha
Drasa	7343	104.8	70
Waqadra	4147	60.2	69
Rarawai	5089	80.9	64
Peneng	257	2.8	92
Labasa	1884	28.4	66
Total	**18720**	**277.1**	**72.2**

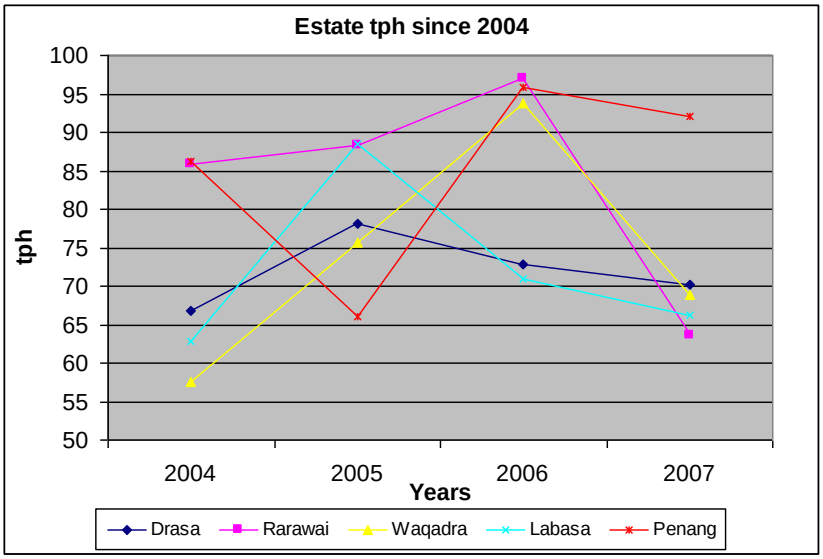


Figure 1: All Estate Yield (2004 – 2007).

EXTENSION

In 2007, the number of registrations was 18694 with the registered cane area of 82182 hectares. The total area cultivated was 64393 hectares. A crop of 2478691 tonnes of cane was harvested from an area of 52558 hectares and 237418 tonnes of sugar was produced. There was decline in cane yield from 58 tonnes per hectare in 2006 to 47 tonnes per hectare in 2007. This was mainly due to lack of interest by cane growers.

The sugar yield was 4.60 tonnes 94NT per hectare. The yield declined due to poor crop husbandry and erratic crush. The burnt cane was 41 percent of total cane crushed. Mana was the dominant variety crushed at all Viti Levu mills accounting for 91 percent of the crop harvested at these mills and 66 percent of the total crop.

The rainfall at the mills centres during the growing period (May 06 - April 07) was 113, 115, 83 and 75 percent of the LTM for Lautoka, Rarawai, Labasa and Penang mill respectively. The monthly rainfall for the four mill centres from May 2006 to April 2007 in comparison to LTM is shown in Table 1.

Table 1: Rainfall (mm) for all mills from May 2006 to April 2007

Mills	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Lautoka Mill													
Monthly Rainfall	105.4	39.6	27.6	76.9	51.7	114.9	113.1	114.5	60.9	438.5	674.1	223.5	**2040.7**
No. of raindays	5	4	2	4	7	12	6	12	11	17	25	16	**121**
95 years avg.	97.8	65.3	49.5	71.1	68.9	89.4	121.6	188.8	294.6	317.3	313.8	182.9	**1801**
Rarawai Mill													
Monthly Rainfall	95.2	52.9	18.7	90.5	57.3	120.4	142.9	325.2	110.3	583.0	903.8	160.8	**2661**
No. of raindays	7	5	2	5	6	10	7	17	11	18	25	14	**127**
118 years avg.	77.5	35.9	27.6	100.7	102.2	147.1	221.2	239.0	347.4	355.3	361.2	296.0	**2309.1**
Labasa Mill													
Monthly Rainfall	46.3	47.0	16.5	49.8	63.6	69.3	46.0	186.4	99.5	458.2	619.0	166.9	**1868.5**
No. of raindays	8	8	3	7	7	10	8	17	10	22	26	16	**142**
114 years avg.	109.2	64.6	47.2	50.5	100.3	101.1	202.7	250.1	360.5	359.1	379.0	237.9	**2262.2**
Penang Mill													
Monthly Rainfall	65.4	58.8	24.1	83.0	80.8	107.6	34.4	164.1	64.2	343.1	716.0	185.7	**1927.2**
No. of raindays	9	9	4	6	10	15	11	10	13	21	26	18	**152**
106 years avg.	120.8	69.0	52.1	94.0	83.9	147.5	147.8	235.3	425.2	349.0	412.5	389.2	**2526.3**

Fertilizer usage

The NPK usage (kg/hectare) in all mill areas (2000 – 2008 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 fertilizer usage (kg/ha) in all mills (Crop Years 1999 -2007)

Mill	Fertilizer	2000	2001	2002	2003	2004	2005	2006	2007	2008
Lautoka	**N**	87.6	51.1	68.9	79.0	75.5	82.1	79.5	76.0	67.5
	P	15.0	8.9	11.9	13.6	13.1	13.9	13.3	12.9	11.7
	K	60.7	35.4	47.7	56.0	53.8	59.0	58.4	56.7	50.2
Rarawai	**N**	89.1	60.3	72.8	82.5	81.7	72.0	81.3	83.8	77.0
	P	15.6	12.3	11.6	13.5	14.0	12.6	12.6	13.5	13.0
	K	62.5	40.9	53.1	58.6	57.5	55.0	59.3	59.2	47.8
Labasa	**N**	99.4	94.7	87.4	96.5	66.9	113.8	100.8	104.0	78.8
	P	19.6	18.5	18.1	19.3	13.7	22.8	20.1	20.5	15.7
	K	69.3	74.6	61.0	68.0	47.3	81.2	72.0	74.5	56.5
Penang	**N**	84.8	73.6	89.4	82.4	68.0	103.7	85.3	82.2	86.7
	P	14.3	12.5	15.2	14.8	13.9	18.6	15.7	14.8	15.2
	K	61.0	52.8	64.3	59.5	56.3	76.6	65.8	64.6	68.1
All mill avg.	**N**	91.4	67.7	76.8	85.2	74.4	89.9	86.7	87.0	75.4
	P	16.5	12.9	13.8	15.2	13.6	16.4	15.2	15.5	13.6
	K	63.8	49.2	49.5	60.4	53.4	65.6	63.0	63.3	54.8

Table 3: Area Harvested and amounts of N, P, K used in the Fiji Sugar Industry, 1987 - 2008 crop.

Crop Year	Harvested Area	Nutrients Applied in Tonnes			Proportions		
	Ha	N	P	K	N	P	K
1987	66511	6769	501	1154	13.5	1.0	2.3
1988	63817	8002	733	1426	10.9	1.0	1.9
1989	71158	10141	885	2382	11.5	1.0	2.7
1990	69666	7777	649	1774	12.0	1.0	2.7
1991	72709	8347	643	1886	13.0	1.0	2.9
1992	72649	6551	870	3336	8.5	1.0	3.8
1993	75089	6844	1186	4506	5.8	1.0	3.8
1994	74388	7158	1380	4945	5.2	1.0	3.6
1995	73977	7660	1335	5315	5.7	1.0	4.0
1996	73981	7520	1413	5193	5.3	1.0	3.7
1997	73312	7050	1339	4885	5.3	1.0	3.6
1998	57039	7050	1351	1885	5.2	1.0	3.6
1999	64535	7852	1597	5406	4.9	1.0	3.4
2000	66943	6902	1249	4821	5.5	1.0	3.9
2001	66305	4710	901	3427	5.2	1.0	3.8
2002	62625	4811	864	3101	5.6	1.0	3.6
2003	60912	5187	927	3681	5.6	1.0	4.0
2004	60080	4471	816	3206	5.5	1.0	3.9
2005	62204	5591	1020	4079	5.5	1.0	4.0
2006	55438	5212	914	3944	5.7	1.0	4.3
2007	52558	3963	715	2880	5.5	1.0	4.0
2008	**54067**	**4194**	**758**	**3047**	**5.5**	**1.0**	**4.0**

FIELD ACTIVITIES CROP PRODUCTION TABLES (FACP)

Appendix 1 : Main features of 2006 season compared with 2005

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Total registrations	6662	6662	5565	5554	4153	4172	2277	2306	18657	18694
Total farm basic allotments (tonnes)	1288975	1281722	1120082	1123500	992990	981086	322433	326996	3724480	3713304
Total registered area (hectares)	27949	27872	23722	23710	19767	19682	10796	10918	82234	82182
Total area cultivated (hectares)	21672	20108	21524	21070	19378	18113	5279	5102	67853	64393
Total area harvested (hectares)	17125	16376	17127	16892	16510	14636	4675	4655	55438	52558
Total farm harvest quotas (tonnes)	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Sugar make actual(tonnes)	93392	72747	104963	76775	81477	66640	30308	21256	310140	237418
Tonnes 94 N.T sugar	97315	75656	106832	78786	83969	68255	30987	21858	318563	244555
Yield tonnes 94 N.T.sugar per hectare	5.10	4.62	6.23	4.66	5.08	4.66	6.63	4.70	5.75	4.65
Tonnes cane per tonnes sugar 94 N.T.	9.16	9.82	9.73	9.75	10.37	11.20	9.27	10.80	10.13	10.24
%POCS	10.65	11.25	11.49	11.60	11.38	10.44	11.85	11.45	11.34	11.19
Cane purity average for season	79.6	81.6	82.8	82.3	81.2	80.1	83.9	83.6	81.88	81.9
Tonnes cane harvested	1051097	741231	1039474	738478	871031	769138	264498	229844	3226100	2478691
Tonnes cane crushed	1058730	739329	1031941	740381	871027	769138	264398	229844	3226096	2478691

Appendix 2: Monthly rainfall(mm) for 2007 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	**2007 actual**	60.9	438.5	674.1	223.5	41.9	0.5	48.8	21.6	201.8	111.4	268.0	271.7	**2362.7**
	98 yrs average to 2006	294.6	317.3	313.8	182.9	97.2	64.6	49.5	70.6	70.3	89.6	123.1	189.7	**1863.2**
Rarawai	**2007 actual**	110.3	583.0	903.8	160.8	13.8	7.1	42.2	14.3	239.2	140.0	305.4	285.4	**2805.3**
	121 yrs average to 2006	347.4	355.3	361.2	296.0	77.0	35.6	27.8	99.9	103.3	147.1	221.9	239.4	**2311.8**
Labasa	**2007 actual**	99.5	458.2	619.0	166.9	101.4	55.5	29.5	48.7	327.2	131.0	310.4	438.9	**2786.2**
	118 yrs average to 2006	360.5	359.1	379.0	237.9	109.1	64.5	47.0	50.4	102.2	101.3	203.6	251.7	**2266.5**
Penang	**2007 actual**	64.2	343.1	716.0	185.7	80.2	25.0	35.8	29.7	204.3	45.4	329.9	557.8	**2617.1**
	109 yrs average to 2006	425.2	349.0	412.5	389.2	120.4	68.6	52.0	93.4	85.0	146.6	149.5	238.2	**2529.5**

Appendix 3: Crop production details

	Lautoka		Rarawai		Labasa		Penang		All mills	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Areas harvested (hectares)										
Plant	850	507	1651	975	1341	797	457	411	4299	**2690**
First ratoon	795	809	1074	1581	1828	1370	479	446	4176	**4206**
2nd ratoon	1005	777	837	974	1215	1567	495	435	3552	**3753**
Other ratoons	14475	14283	13565	13361	12127	10902	3244	3363	43411	**41909**
Total	17125	16376	16127	16891	16511	14636	4675	4655	55438	**52558**
Proportion of crop harvested according to area										
Plant	5.0	3.1	11.6	5.8	8.1	5.4	9.8	8.8	7.8	**5.1**
First ratoon	4.6	4.9	7.2	9.4	11.1	9.4	10.3	9.6	7.5	**8.0**
2nd ratoon	5.9	4.7	5.2	5.8	7.3	10.7	10.6	9.4	6.4	**7.1**
Other ratoons	84.5	87.2	76.0	79.1	73.5	74.5	69.4	72.3	78.3	**79.7**
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**
Yield tonnes per hectare harvested										
Plant	81.9	65.6	72.7	55.4	64.1	65.5	63.8	60.2	71.1	**61.1**
First ratoon	74.2	58.6	68.9	51.6	65.1	66.2	55.4	57.1	66.9	**58.3**
2nd ratoon	67.0	50.5	63.9	47.7	56.7	57.4	52.1	49.1	60.8	**52.5**
Other ratoons	59.1	43.5	57.7	41.6	49.2	49.2	56.4	47.1	55.9	**44.7**
Average yield/ha	61.4	45.3	60.2	43.7	52.7	52.6	56.6	49.4	58.2	**47.2**
Main varieties crushed according to tonnes (%)										
Ragnar	0.5	0.4	0.6	0.4	23.8	22.8	0.1	0.1	7.4	**6.6**
Aiwa	1.0	0.4	0.8	0.5	0.5	0.4	0.3	0.3	0.7	**0.4**
Beqa					1.1	0.7	-		0.3	**0.2**
Galoa	0.1	0.1			5.5	5.2	-		1.7	**1.5**
Kaba	3.8	3.5	5.4	5.5	0.4	0.4	0.8	1.1	3.0	**3.0**
Mali					16.6	16.0	1.8	0.8	5.1	**4.5**
Mana	91.2	92.8	88.7	89.7			85.1	88.9	62.8	**65.6**
Naidiri	3.1	2.5	2.7	2.7	12.7	17.7	11.1	8.4	6.5	**7.3**
Vatu					29.4	27.1	0.7	0.4	8.8	**7.6**
Waya			1.7	1.0	10.0	9.4	-		3.5	**3.0**
Expt./Others	0.3	0.3	0.1	0.1		0.2	0.1	0.1	0.2	**0.3**
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**

Appendix 4: Rainfall (mm) at mill centres

Mill	For 12 months ended 31st December					For 12 months ended 30th September				
	2003	2004	2005	2006	**2007**	2003	2004	2005	2006	**2007**
Lautoka	1459	1489	1580	1844.0	**2362.7**	1289	1670	1281	1923.8	**2054.1**
Rarawai	1919	1960	1745	2162.1	**2805.3**	1499	2393	1328	2110.8	**2663.0**
Labasa	1834	1568	1803	2152.7	**2786.2**	1748	1731	1411	2452.2	**2207.6**
Penang	1889	1573	1516	1824.0	**2618.0**	1657	1927	1330	1775.7	**1991.0**

Appendix 5: Rainfall distribution affecting 2007 crop(mm)

Month	Period	Lautoka	Rarawai	Labasa	Penang
Jul'06	Early	25.0	16.5	10.8	17.5
	Mid	2.6	2.2	0.0	6.6
	Late	0.0	0.0	5.7	0.0
Aug'06	Early	37.9	38.5	11.0	61.0
	Mid	39.0	46.0	37.0	22.0
	Late	0.0	6.0	1.8	0.0
Sep'06	Early	0.0	0.0	6.0	0.0
	Mid	37.8	46.6	19.4	45.2
	Late	13.9	10.7	38.2	35.6
Oct'06	Early	67.3	72.7	27.2	40.9
	Mid	37.4	42.1	19.6	16.8
	Late	10.2	5.6	22.5	49.9
Nov'06	Early	1.7	5.3	2.9	12.3
	Mid	63.6	65.0	8.1	10.1
	Late	47.8	72.6	35.0	12.0
Dec'06	Early	17.6	68.6	36.5	12.7
	Mid	73.4	132.3	49.8	116.0
	Late	23.5	124.3	100.1	35.4
Jan'07	Early	43.6	26.9	64.3	45.7
	Mid	12.9	78.2	19.2	9.7
	Late	4.4	5.2	16.0	8.8
Feb'07	Early	257.2	310.9	342.1	207.7
	Mid	163.2	260.2	106.5	113.8
	Late	18.1	11.9	9.6	21.6
Mar'07	Early	238.5	313.7	234.4	298.6
	Mid	99.6	222.7	193.6	152.6
	Late	336.0	367.4	191.0	264.8
Apr'07	Early	22.1	22	91.1	56.2
	Mid	182.4	107.1	38.5	96.2
	Late	19	31.7	37.3	33.3
May'07	Early	15.8	6.3	36.3	27.4
	Mid	16.9	6.6	62.6	40.7
	Late	9.2	0.9	2.5	12.1
Jun'07	Early	0.5	7.1	43.7	25.0
	Mid	0.0	0.0	10.8	0.0
	Late	0.0	0.0	1.0	0.0
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

Appendix 5: Cont'd

Month	Month	Month	Month	Month	Month
Nov'07	Early	106.0	100.2	17.8	145.2
	Mid	30.6	49.8	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	112.7	57.9	63.8	55.7
	Late	142.1	212.4	160.2	191.0
Total		**2861.4**	**3560.3**	**3217.8**	**3112.0**

Early - From 1st to 10th of the month Mid - From 11th to 20th of the month Late - From 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	2003	2004	2005	2006	**2007**
Lautoka	Plt	5904	4007	3634	2944	1042	1183	1272	854	850	**507**
	Rtn	18108	19743	20580	19701	19730	19276	18876	18220	16275	**15869**
	Total	24012	23750	24214	22645	20772	20459	20148	19074	17125	**16376**
Rarawai	Plt	4463	3574	2899	3164	1055	1129	916	1045	1651	**975**
	Rtn	13836	14805	17360	14613	17585	17613	17550	16496	15476	**15916**
	Total	18299	18379	20259	17777	18640	18742	18466	17541	17127	**16891**
Labasa	Plt	2365	2512	3120	2597	1269	1067	1035	1808	1341	**797**
	Rtn	16306	17181	19604	18348	15911	15655	15446	15232	15169	**13839**
	Total	18671	19693	22724	20945	17180	16722	16481	17040	16510	**14636**
Penang	Plt	1697	1396	1386	1120	542	647	573	515	457	**411**
	Rtn	4036	5029	4958	4674	4568	4342	4412	4418	4218	**4244**
	Total	5733	6425	6344	5794	5110	4989	4985	4933	4675	**4655**
All mills	Plt	14429	11489	11039	9825	3908	4026	3795	4222	4298	**2690**
	Rtn	52286	56758	62502	57336	57794	56886	56285	54366	51140	**49868**
	Total	66715	68247	73541	67161	61702	60912	60080	58588	55438	**52558**

Appendix 7 : Tonnes of cane harvested

Mills	Average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/2000	2001/05	2003	2004	2005	2006	**2007**
Lautoka	1254266	1048942	1283569	1216597	971454	890499	1032127	890779	1051097	**741231**
Rarawai	984244	1006366	1017374	957507	878509	836728	878121	761704	1039474	**738478**
Labasa	980634	1015166	1166055	1017061	840388	638851	848533	910663	871031	**769138**
Penang	310406	332592	291206	309205	239044	243602	242408	225594	264498	**229844**
All mills	3529550	3403066	3758204	3500370	2929395	2609680	3001189	2788740	3226100	**2478691**

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	1996/2000	2001/05	2003	2004	2005	2006	2007
Lautoka	Plt	61.7	65.4	64.7	64.2	63.9	60.8	66.5	64.4	81.9	**65.6**
	Rtn	48.0	54.2	51.2	51.4	45.9	49.1	50.2	45.9	59.1	**43.5**
	Total	51.4	55.5	52.4	53.7	46.8	43.5	51.2	46.7	61.4	**45.3**
Rarawai	Plt	65.1	64.3	61.2	62.1	59.6	57.9	61.2	58.1	72.7	**55.4**
	Rtn	51.3	52.0	48.1	52.9	46.4	47.8	46.8	42.5	57.7	**41.6**
	Total	53.3	54.2	50.1	53.9	47.1	44.6	47.6	43.4	60.2	**43.7**
Labasa	Plt	63.9	58.9	59.3	56.5	59.7	48.0	64.6	63.1	64.1	**65.5**
	Rtn	50.8	51.5	50.4	47.4	47.6	42.9	50.6	52.3	49.2	**49.2**
	Total	52.5	51.5	51.3	48.6	48.9	38.2	51.5	53.4	52.7	**52.6**
Penang	Plt	63.3	63.1	57.2	62.6	54.2	56.9	53.7	52.2	63.8	**60.2**
	Rtn	50.5	48.6	43.1	51.2	46.4	50.5	47.9	47.1	56.4	**47.1**
	Total	54.3	51.1	46.0	53.3	46.8	48.8	48.6	45.7	56.6	**49.4**
All	Plt	63.5	62.6	61.2	61.8	58.3	55.9	62.8	60.8	71.1	**61.1**
mills	Rtn	49.5	55.8	48.1	50.0	46.0	42.2	46.0	46.6	55.9	**44.7**
	Total	52.6	53.3	50.2	52.1	47.5	42.8	50.0	47.6	58.2	**47.2**

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

Mills	2007 hectares (A)			Hectares harvested as % various categories "A"	
	Registered (1)	Cultivated (2)	Harvested	(1)	(2)
Lautoka	27872	20108	16376	59	81
Rarawai	23710	21070	16892	71	81
Labasa	19682	18113	14636	74	81
Penang	10918	5102	4655	43	91
Total	82182	64393	52558	64	82

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	1996/2000	2001/05	2003	2004	2005	2006	2007
Lautoka	26	17	15	13	5	6	6	4	7	**3**
Rarawai	24	19	14	18	6	6	5	6	12	**6**
Labasa	11	13	14	12	7	6	6	11	10	**5**
Penang	29	22	23	19	11	13	11	10	11	**9**
All mills	21	17	16	15	7	8	6	7	10	**5**

Appendix 11: Plant and ratoon yields and percentage of total area harvested - 2007 Crop

Mills	Plant		First ratoon		Other ratoons		All cane	
	Tc/ha	% Area	Tc/ha	% Area	Tc/ha	% Area	Tc/ha	% Area
Lautoka	65.6	3	58.6	5	43.5	92	45.3	100
Rarawai	55.4	6	51.6	9	41.6	85	43.7	100
Labasa	65.5	5	66.2	9	49.2	86	52.6	100
Penang	60.2	9	57.1	19	47.1	62	49.4	100
All Mills	61.1	5	58.3	8	44.7	87	47.2	100

Appendix 12 : Seasonal %POCS in cane

Mills	Rough average for period of five seasons					Last five seasons individually				
	1981/85	1986/90	1991/95	1996/2000	2001/05	2003	2004	2005	2006	**2007**
Lautoka	12.19	12.00	12.50	11.42	11.45	12.13	11.28	11.52	10.65	**11.25**
Rarawai	12.12	12.09	12.90	11.35	11.87	12.84	12.09	11.46	11.49	**11.60**
Labasa	12.20	12.37	12.12	11.07	11.54	12.97	11.12	10.93	11.38	**10.44**
Penang	12.28	12.15	12.59	11.13	11.88	12.81	11.29	12.29	11.85	**11.45**
All Mill Avg.	12.15	12.27	12.51	11.24	11.69	12.69	11.45	11.54	11.34	**11.19**

Appendix 13: Weekly POCS in cane 2007 season

Week no.	Week ending	Lautoka	Rarawai	Labasa	Penang
1	11 June 07	9.52	10.00	9.71	9.82
2	18 June 07	9.88	10.21	10.06	9.73
3	25 June 07	9.96	10.98	10.10	10.21
4	2 July 07	10.54	10.62	10.33	10.76
5	9 July 07	10.83	10.82	10.30	10.68
6	16 July 07	11.03	11.20	10.22	10.63
7	23 July 07	11.34	11.39	10.55	11.05
8	30 July 07	11.48	11.90	10.94	11.42
9	6 Aug 07	11.34	12.10	10.41	11.86
10	13 Aug 07	11.37	12.36	11.07	12.13
11	20 Aug 07	11.76	12.63	11.65	12.03
12	27 Aug 07	11.75	12.77	11.58	12.39
13	3 Sep 07	12.20	12.72	10.62	12.42
14	10 Sep 07	12.25	13.02	10.89	12.73
15	17 sep 07	11.98	12.74	10.75	12.95
16	24 Sep 07	11.99	12.89	11.35	12.17
17	1 Oct 07	11.87	11.96	10.63	12.30
18	8 Oct 07	11.83	12.21	10.94	12.23
19	15 Oct 07	11.73	11.95	10.92	11.74
20	22 Oct 07	10.96	11.10	11.20	10.87
21	29 Oct 07	11.20	10.94	10.64	9.62
22	5 Nov 07	10.55	10.64	10.58	9.79
23	12 Nov 07	10.12	10.38	10.18	10.77
24	19 Nov 07	9.53	9.45	9.80	
25	26 Nov 07			9.03	
26	03 Dec 07			9.11	
27	10 Dec 07			8.06	
28	17 Dec 07			8.28	
29	24 Dec 07			8.50	
30	31 Dec 07				
Season Average		**11.25**	**11.60**	**10.44**	**11.45**

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

Mills	Tonnes sugar 94 N.T equivalent						
	2001	2002	2003	2004	2005	2006	**2007**
Lautoka	96290	103867	103202	110684	97315	96875	**75656**
Rarawai	94036	118667	101324	100664	84258	106781	**78786**
Labasa	87544	90315	75830	87802	90347	83970	**68255**
Penang	20371	25691	25453	24716	24733	30937	**21858**
All mills	298241	338540	305809	323866	296653	318563	**244555**

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	1996/2000	2001/05	2003	2004	2005	2006	**2007**
Lautoka	5.97	6.55	6.15	5.61	4.92	5.04	5.41	5.10	5.60	**4.62**
Rarawai	6.38	6.36	6.29	5.61	5.38	5.41	5.45	4.80	6.23	**4.66**
Labasa	6.20	6.20	6.00	4.95	4.97	4.53	5.20	5.30	5.09	**4.66**
Penang	6.34	5.70	5.47	5.42	4.65	5.10	4.81	5.01	6.63	**4.70**
Average	6.21	6.28	6.05	5.39	5.06	5.02	5.39	5.06	5.75	**4.65**

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	2003	2004	2005	2006	**2007**
						25.7	28.1	25.6	32.4	**24.0**
Lautoka	29.3	28.8	28.0	29.7	27.6	Jun 25	Jun 22	Jun 07	Jun 05	**Jun 07**
						Dec 22	Jan 04	Dec 03	Jan 11	**Nov 18**
						23.3	23.9	20.9	30.8	**23.8**
Rarawai	26.4	26.2	25.3	26.5	24.2	Jun 18	Jun 16	Jun 01	May 31	**Jun 18**
						Nov 28	Dec 01	Oct 25	Jan 01	**Nov 18**
						20.0	25.2	29.1	29.0	**29.1**
Labasa	27.9	26.6	29.4	30.7	24.1	Jul 22	Jun 22	Jun 01	Jun 06	**Jun 06**
						Dec 08	Dec 08	Dec 15	Dec 25	**Dec 25**
						19.1	19.5	18.3	21.4	**22.1**
Penang	28.1	25.5	21.5	26.2	20.4	Jun 18	Jul 06	Jun 28	Jun 20	**Jun 06**
						Oct 30	Nov 20	Nov 11	Nov 16	**Nov 06**
All mills	28.4	26.8	26.1	28.2	24.1	22.0	24.2	23.5	28.4	**24.8**

Appendix 17 : Varietals performance

Varieties	Percent of hectares harvested									
	Lautoka		Rarawai		Labasa		Penang		All Mills	
	2006	**2007**	2006	**2007**	2006	**2007**	2006	**2007**	2006	**2007**
Ragnar	0.4	0.4	0.6	0.4	24.6	22.8	0.1	0.1	7.4	6.6
Waya			1.7	1.0	8.5	9.4			3.5	3.0
Mali					15.9	16.0	1.5	0.8	5.1	4.5
Homer										
Spartan										
Galoa	0.1	0.1			5.4	5.2			1.7	1.5
Aiwa	0.9	0.4	0.8	0.5	0.4	0.4	0.4	0.3	0.7	0.4
Ono										
Yasawa										
Vomo										
Mana	91.4	92.8	88.5	89.7	0.1		86.4	88.9	62.8	65.6
LF 91 - 1925										
Kaba	3.4	3.5	5.3	5.5	0.3	0.4	0.8	1.1	3.0	3.0
Vatu					28.0	27.1	0.6	0.4	8.8	7.6
Beqa			0.3		0.9	0.7			0.3	0.2
Naidiri	3.4	2.5	2.7	2.7	15.8	17.7	10.1	8.4	6.5	7.3
Exp.	0.1	0.2								0.1
Other var.	0.3	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.3	0.2

Appendix 18 : Planting - areas

Mills	Hectares planted (A)					A as percentage of registered area					A as percentage of area cultivated				
	2003	2004	2005	2006	**2007**	2003	2004	2005	2006	**2007**	2003	2004	2005	2006	**2007**
Lautoka	1343	881	848	611	**800**	4	3	3	2	**3**	4	3	3	3	**4**
Rarawai	1116	1078	1344	1096	**840**	4	4	5	5	**4**	5	5	6	5	**4**
Labasa	1276	1504	1241	893	**1521**	6	7	5	5	**8**	6	7	7	5	**8**
Penang	603	525	520	453	**453**	5	5	5	4	**4**	11	10	9	8	**9**
Total	4338	3988	3950	3053	**3614**	5	4	4	4	**4**	5	5	5	4	**6**

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

Year	*Varieties*	Lautoka	Rarawai	Labasa	Penang	All mills
2005	Ragnar	0.5	0.3	10.7	0.1	3.6
2006	Ragnar	0.8	0.4	7.2	-	2.4
2007	**Ragnar**	**-**	**0.2**	**6.9**	**-**	**3.0**
2005	Waya	-	0.7	3.0	-	1.2
2006	Waya	-	1.9	3.4		1.7
2007	**Waya**	**-**	**1.3**	**5.4**	**-**	**2.6**
2005	Mana	76.1	85.1	-	78.5	55.6
2006	Mana	85.0	85.9	-	84.8	60.8
2007	**Mana**	**90.8**	**88.8**	**-**	**84.8**	**51.4**
2005	Galoa	-	-	4.9	-	1.5
2006	Galoa	0.8	-	6.1	-	1.9
2007	**Galoa**	**0.2**	**-**	**4.4**	**-**	**1.9**
2005	Vatu	-	-	18.8	0.1	5.9
2006	Vatu	-	-	9.9	-	2.8
2007	**Vatu**	**-**	**-**	**7.5**	**-**	**3.2**
2005	Mali	-	-	7.1	0.6	2.3
2006		-	-	6.9	0.2	2.0
2007	**Mali**	**-**	**-**	**6.6**	**0.2**	**2.8**
2005	Aiwa	1.9	0.4	0.9	-	0.8
2006		0.5	-	0.4	-	0.2
2007	**Aiwa**	**0.5**	**-**	**0.2**	**-**	**0.2**
2005	Beqa	-	-	0.1	-	-
2006	Beqa	0.6	-	-	-	0.1
2007	**Beqa**	**1.0**	**-**	**0.1**	**-**	**0.3**
2005	Kaba	13.6	7.7	1.5	0.3	6.0
2006	Kaba	6.4	6.0	-	-	3.5
2007	**Kaba**	**3.9**	**5.8**	**0.1**	**-**	**2.3**
2005	Naidiri	6.5	5.7	53.0	20.4	22.7
2006	Naidiri	4.4	5.2	65.3	15.0	23.8
2007	**Naidiri**	**2.3**	**2.4**	**68.1**	**15.0**	**31.6**
2005	O/varieties	1.4	0.1	-	-	0.4
2006		1.5	0.5	0.7	-	0.7
2007	**O/Varieties**	**1.3**	**1.5**	**0.7**	**-**	**0.7**

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	2003	40059	4	305169	34	545271	61	890499	100
	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**
Rarawai	2003	54763	7	331956	40	450009	54	836728	100
	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**
Labasa	2003	18693	3	206198	32	413960	65	638851	100
	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**
Penang	2003	17996	7	52153	21	173453	71	243602	100
	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**
Mills	2003	131511	5	895476	36	1582693	59	2609680	100
	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**

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**

APPROVED CANE 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

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