

# SUGAR INDUSTRY AUTHORITY

## ANNUAL REPORT 2008

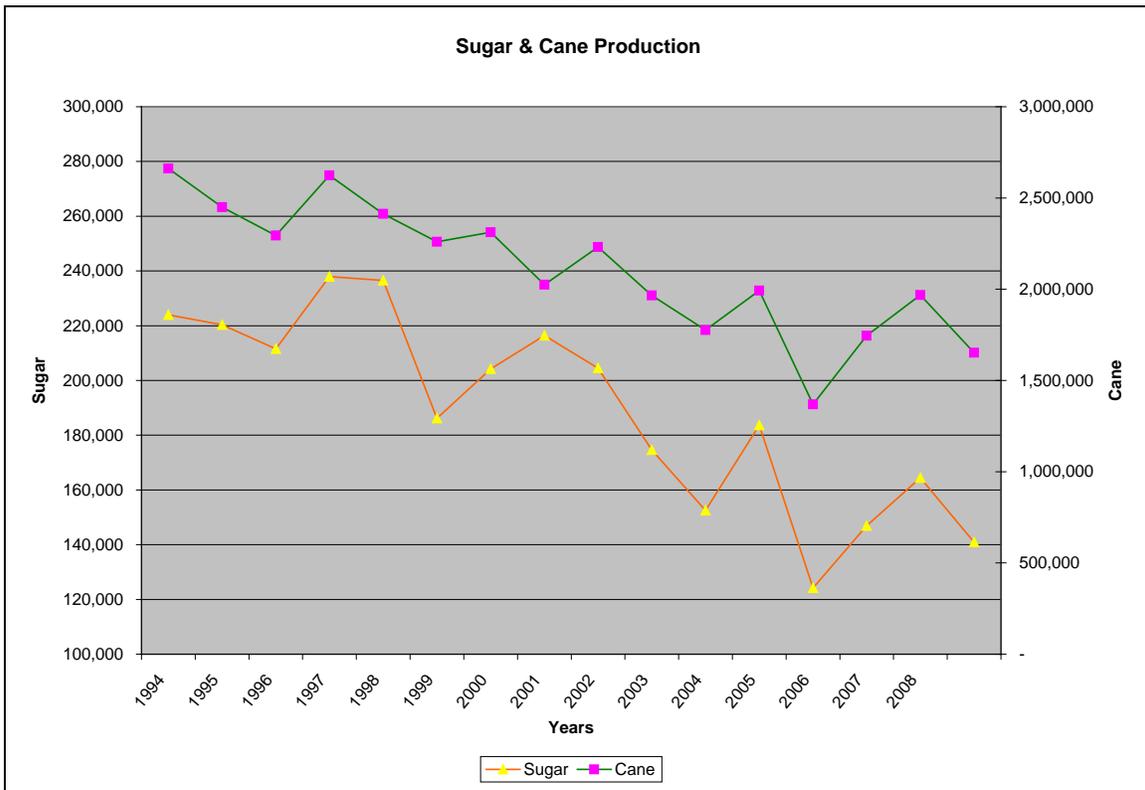
### INTRODUCTION

The 2007/2008 crop commenced at Frome Sugar Factory on December 28, 2007 and ended at Bernard Lodge Sugar Factory on August 2, 2008. The duration of the crop was 219 days compared with 253 days for the previous crop, a decrease of 34 days. All seven factories saw a decline in production when compared with the previous crop. The passage of Hurricane Dean in August 2007 and several disruptions due to poor weather condition were the main factors responsible for the decline in production.

### PRODUCTION

Sugar production for the crop was 140,872 tonnes of 96° sugar, which represents a decrease of 14 per cent over the previous year's production of 164,387.( Table 2) The volume of cane crushed, excluding cane to distilleries, was 1,652,049 tonnes, 16 per cent less than the 1,968,009 tonnes produced in the previous year (Table 1).

Chart 1



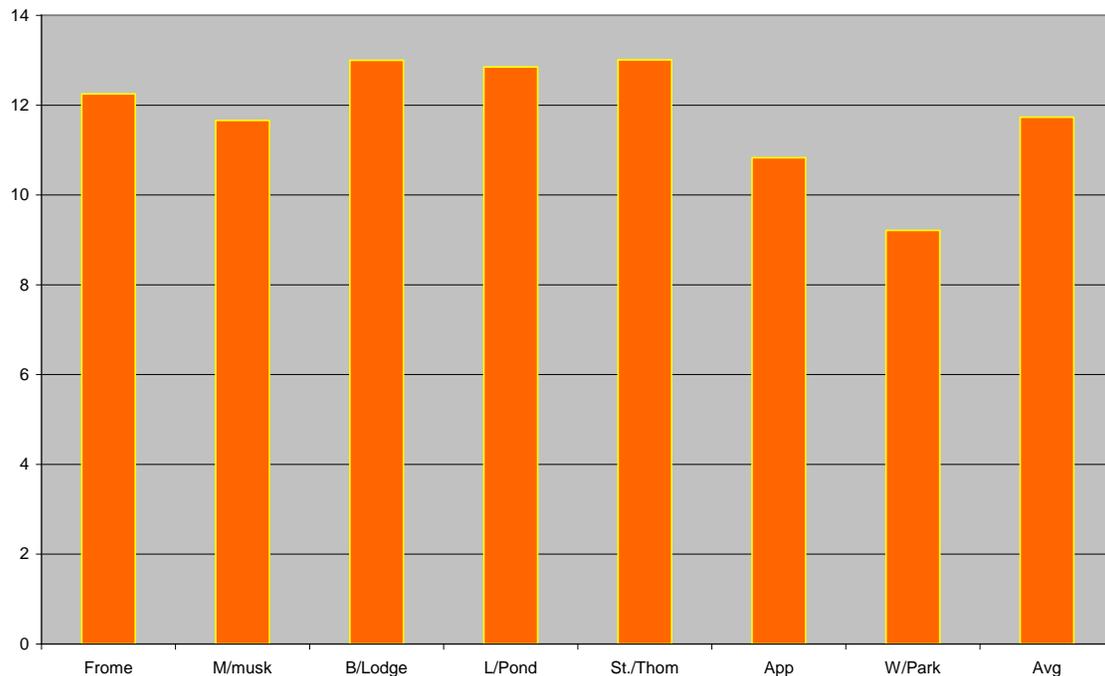
## SELECTED PRODUCTION STATISTICS FOR THE 2007 & 2008 CROPS

	2007	2008
<b>Cane Milled ('000 tonnes)</b>	<b>1,968</b>	<b>1,652</b>
<b>Farmers</b>	<b>784</b>	<b>644</b>
<b>Estates</b>	<b>1,184</b>	<b>1,008</b>
<b>96° Sugar Production ('000 tonnes)</b>	<b>164.4</b>	<b>140.9</b>
<b>Hectares Reaped ('000)</b>	<b>30.79</b>	<b>29.89</b>
<b>Tonnes cane/hectare</b>	<b>63.92</b>	<b>55.27</b>
<b>Tonnes cane /tonne sugar</b>	<b>11.97</b>	<b>11.73</b>
<b>Tonnes sugar/hectare</b>	<b>5.34</b>	<b>4.71</b>

The tonnes cane per tonne sugar (TC/TS) ratio was 11.73 this represent a slight improvement when compared with previous year's ratio of 11.97. Harvesting at several estates were adversely affected due the extensive rainfall during the period. Only the months of January and February provided good conditions for reaping. The TC/TS was also affected by relative inefficiency of the factories as only four factories recorded increases in their Factory Recovery Index (FRI) when compared to the previous crop.

Chart 2

TC/TS



## CANE QUALITY

Performances, measured by the Factory Recovery Index (FRI) and the Jamaica Recoverable Cane Sugar (JRCS), were mixed when compared to the previous year.

Average FRI was relatively stable moving from 88.26 in 2006/07 to 88.21 in 2007/08 while average JRCS increased from 9.69 to 9.97 during the same period. Only two factories, Appleton and Worthy Park surpassed the standard FRI of 91.00 units. All the other factories had performances in the eighties, with the exception of Frome with a FRI of 90.68. All factories reported an improvement in their cane quality (JRCS) however only three factories, Worthy Park, Monymusk, and Long Pond surpass the standard JRCS of 10.15. (Table 3)

## PRICES

The price paid to growers and millers continued on its upward trend. They were paid \$43,344 per tonne sugar, and increase of 14% over the 37,387 paid in 2006/07. This represents the highest price paid to date. This level of payment was made possible because of increased earnings from the export of sugar to the European Union resulting from the continued strengthening of the euro in which sales of our sugar are denominated. The division of the payment between cane growers and manufacturers according to the split of 62% to growers and 38% to manufacturers was as follows:

		<u>2006/07</u>	<u>2007/08</u>
Cane Growers	(62%)	\$23,520	\$26,873
Sugar Manufacturers	(38%)	<u>\$14,416</u>	<u>\$16,471</u>
		<u>\$37,936</u>	<u>\$43,344</u>

## TIME LOSS

The actual grinding time for all factories was 48.73 per cent of total available time. There was no significant difference when compared to last year's figure of 50.35 per cent. Non-factory stoppages, which stood at 31.77 per cent, was the main factor responsible for the significant time loss. The adverse weather conditions towards the latter part of the crop affected deliveries by farmers and estates. Mechanical stoppage, 9.72 per cent was the main factor responsible for factory stoppages of 19.50 per cent. All seven factories found it difficult to achieve the industry standard operating time of 85 per cent. Worthy Park performed the best with an operating time of 59.69. All other factories had operating time of less than 50 per cent, with the exception of Frome which had operating time 59.34 per cent.

## MARKETING

The total (gross) value of sugar exports in 2007/08 was US\$104,682,936 and this was 3.4 percent above the value of US\$101,246,334 in 2006/07. The volume of sugar exported was 136,070 tonnes of which 136,048 tonnes of protocol sugar went to the United Kingdom at a value of US\$104,662,366. A total of 22 tonnes were shipped to the Cayman Islands. No sugar was shipped under the Complementary Quota arrangement or to the United States.

The price per tonne sugar exported to the EU remained at 496.8 euros following the 5.1% reduction in 2006/07 as stipulated in the new EU sugar regime which took effect on July 1, 2006. However, the Euro made significant gains against the US dollar in 2008. As a result the industry was able to realise higher earnings per tonne sugar. The price per tonne sugar received from exports increased from US\$670 in 2006/2007 to US\$769 in 2007/2008.

Chart 3(a)

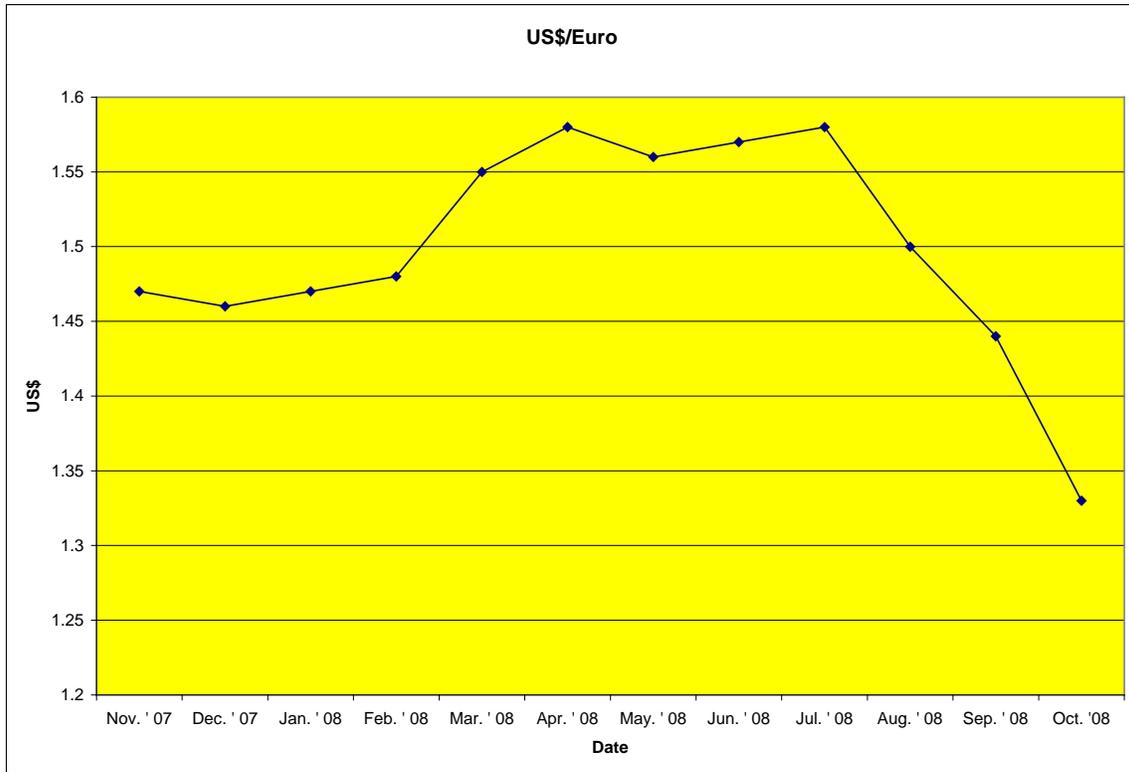


Chart 3(b)



## LOCAL SALES OF RAW SUGAR

The amount of locally produced raw sugar sold on the domestic market during the 2007/2008 crop was 189 tonnes compared with 3,512 tonnes for 2006/07 crop. When sale of imported brown sugar was added to the above, the comparative figures were 52,941 and 54,025 tonnes respectively. The volume of locally produced raw sugar consumed within a crop year is dependent on the level of domestic production because the first objective of the industry is to supply sugar to the preferential markets.

## Sugar Cane Processing Course at UWI

The University of the West Indies, through the Department of Chemistry, continues to include a course in Sugar Cane Processing within the Applied Chemistry programme. The course which is held in the second semester, is the joint effort of UWI and SIA/SIRI. It consists of lectures, tutorials, work study and a field trip. Mr. Ludlow Brown of the SIA conducted the lectures and tutorials.

During the review period the students went on a field trip to Monymusk. Two students were selected to undertake projects in the work study component of the programme. The students were instructed in methods of chemical analysis at the Central Laboratory, SIRI, Mandeville under the supervision of the Laboratory Manager, Dr. Maureen Wilson and the studies were carried out at the UWI supervised by Mr. Niconor Reece, Sugar

Technologist of SIRI and Dr. Ian Thompson of the UWI. The projects involved comparative evaluation of clarifying reagents Octopol and Lead Sub Acetate for use with massecuites and molasses, in addition to molasses, sugar and mixed juice survey for dextran. The projects formed the basis of two papers which were presented at the seventy first annual conference of the Jamaica Association of Sugar Technologists.

## **SUGAR INDUSTRY RESEARCH INSTITUTE**

One of the main roles of the Institute, as the technical and advisory arm of the Authority, is to provide advice on technical issues which may be contained in policy directives from the Ministry of Agriculture to which the SIA as a statutory body reports. It also provides technical support to the SIA in respect of the latter's regulatory responsibility to ensure that the industry adheres to prescribed standards governing its operations. These standards, particularly those relating to the accuracy of operational and process measurements, are of critical importance since these have a direct bearing on the payments cane growers and raw sugar manufacturers receive.

The Institute is the principal research, development and extension organization serving the sugar cane industry and delivers these functions through its three main departments: Agricultural Services, comprising Cane Agronomy, Agricultural Engineering, Variety Development, Extension Services; Factory Services which include Instrumentation, Mechanical Engineering, Sugar Technology and Environmental Monitoring; Central Services which include Information Systems, Economics & Statistics, Central Analytical Services and Administrative Services.

### **Agricultural Services Division**

**The Variety Programme:** During 2008 approximately 32,000 seedlings, constituting the BJ 2010 series, were produced and established in a Stage I nursery at Bernard Lodge. Stages II (BJ 2009 series) and III (BJ 2007 series) were laid down at Monymusk and Frome, respectively.

Two foreign varieties, CR892023 and BT80311, with good sucrose content and high yields were promoted based on results from experiments. Local varieties BJ9310, BJ9221, BJ9250 and BJ9252 showed good promise in the final phase of tests and were slated for pre-commercial extension.

Varieties from the BJ2002 series were put in a smut trial at Holland estate. The sudden and dramatic appearance of smut disease on commercial varieties BJ8532 and J9501 suggested the possibility of a new race of the disease and prompted a re-test of those varieties.

**Sugar Cane Nutrition:** The Institute conducted further experiments with poultry manure to fine tune recommendations for its use in combination with inorganic fertilizers for

growers with access to this product in the Rhymesbury area of Clarendon. Trials in nutrition were carried out also on certain farms in Trelawny with varying rates of major and micro-nutrients superimposed on fields prepared by reduced versus conventional tillage methods.

Fly ash from the factory was added as a soil amendment in trials at Appleton aimed at determining the extent to which use of inorganic potash may be reduced with application of this factory waste.

**Physiology:** Old and new herbicides were tested in a series of trials to determine cost effective methods of weed management at both pre- and post-emergence stages. Meanwhile, Integrated Weed Management was promoted as the preferred approach utilising crop population density, mechanical and chemical methods for most cost effective control. More work was done in testing ethephon as an agent to improve germination and tillering.

**Pathology:** Orange rust disease of sugar cane, caused by *Puccinia kuenhii*, was positively identified for the first time in Jamaica from leaf samples taken at Worthy Park in August 2008. This differs from the brown rust, caused by *Puccinia melanocephala*, which entered the industry during the 1970s. Formerly reported only in the Eastern Hemisphere, orange rust was first detected in the Western Hemisphere in 2007 when a report was made from Florida. In Australia this disease caused severe damage to a very susceptible variety when an outbreak occurred in the 1990s. It has since been found in Central America, Cuba and Jamaica. So far in Jamaica it has been spotted mainly on BJ9186 and BJ7230, both of which are also smut susceptible and grown on only a limited scale, mainly in the Worthy Park area. As the only practical approach to orange rust is resistant varieties the variety development programme is therefore put under additional pressure.

This new disease outbreak occurs at a time when Jamaica is also coming to grips with the recent confirmation of the presence of ratoon stunting disease (RSD) and what could be a new strain of smut which has forced withdrawal of promising varieties just being expanded.

As a precaution against the spread of RSD through the Institute's variety distribution programme, new varieties BJ8783, BJ8841, BT80311 and CR892023 were put through the Institute's newly installed hot water treatment facility. These are being grown in nurseries from which they will be eventually distributed to the industry. High electricity consumption associated with use of the hot water treatment facility led to installation of solar water heaters which should come into full use during 2009.

**Agricultural Engineering:** With farmers now venturing into drip irrigation, SIRI assisted in developing designs for 65 hectares of farm lands in the Clarendon/St Catherine area. The plans included provision for drainage. Installation actually commenced with SIRI's assistance on 15 ha.

SIRI undertook GPS mapping of some 25 000 ha of land on behalf of the Sugar Company

of Jamaica. Proposals were developed for Yield Modelling and Area Estimation as well as GIS/GPS management of sugarcane for possible ACP funding.

A study was conducted and presented on “Water Quality Trends in the Clarendon Plains and its Implication for Cane Growing”. In conjunction with Mapex (a machinery and parts export company) and the Jamaica Cane Growers Association, work was started in testing a new cane harvesting device called a “Cane Thumper.” This permits semi-mechanised harvesting and has the potential to greatly improve productivity in areas which may not be suitable for conventional mechanised harvesting.

**Extension Services:** Although the Common Fund for Commodities (CFC) project to “Enhance the Viability and Competitiveness of Caribbean Sugar Industries” formally came to an end in 2007, there was an extension granted to continue demonstrations with two pieces of equipment acquired late in the programme. The first, the Reduced Tillage Machine, designed by SIRI, significantly reduces cost of land preparation without loss of quality of tilth in land preparation. It also minimises disturbance of soil surface and thus enhances soil conservation. The user also benefits by a much reduced land preparation time thus achieving significant gains in time efficiency. The second machine, the Walk-Behind Tractor, is adapted for use on sites which may be inaccessible to conventional tractors or where use of the latter may be uneconomical. This machine, suitable for use on small farms, may be fitted with a range of attachments to carry out various functions. Both the Reduced Tillage Machine and Walk-Behind Tractors were demonstrated to farmers at various locations during 2008.

Working with farmers participating in the SIA replanting loan programme, the Extension Services did tasks such as processing of applications, compiling farm business plans, assessment of work quality for fund disbursements and monitoring the total project through to harvesting. The team also supplied the SIA with crop production estimates, updates on cane production and productivity as well as assessment of damage caused by tropical storm Gustav.

The radio programme “Raising Cane” which started in 1987 on the Jamaica Broadcasting Corporation (JBC) to promote SIRI extension information, was in its 21<sup>st</sup> year in 2008. With the purchase of JBC by Radio Jamaica Ltd new air time slots were offered to the programme for Tuesdays and Thursdays at 5:45a.m. The programme is now aired on four radio stations (RJR, KLAS, Hot 102 and News Talk 93 FM). The six broadcasts provide useful information to cane growers and the wider industry from interviews and presentations from conferences and seminars. For much of its history the programme was supported by a number of sponsors but has been carried by the SIA exclusively since 2004.

### **Factory Services Division**

The division had a successful year as it met all the requests made to it by the factories, and it achieved the main objectives outlined in its work programmes within budget and in

good time.

## **Mechanical Engineering**

### **1. Core Samplers**

Out of crop maintenance which entailed the repairing or replacing of damaged and malfunctioning components, setting of the press gaps and adjusting the sequence cycles and pressure switches was undertaken at all factories just before the start of the harvesting season. The main activities involved:-

- Repairing and repainting core sampler structures.
- Repairing and repainting the core laboratories.

During the crop, the following problems were experienced and corrective action taken at the following core sampler installations:

#### **(a) Frome**

The #3 press solenoid valve malfunctioned and had to be replaced. The press cylinder was damaged and had to be replaced. The need to replace burst hydraulic hoses was kept to a minimum. Routine building up of all shredder hammers was carried out to maintain the required preparation index levels.

#### **(b) Appleton**

This system had a very good run achieving an overall crop average of 97.37 percentage testing. The hydraulic press cylinder was damaged and had to be replaced.

#### **(c) Bernard Lodge**

The carriage wheel axles, main pump relief valve, hydraulic press cylinder and leaking hoses had to be replaced.

#### **(d) Worthy Park**

Leaks due to a crack in the carriage cylinder were corrected.

#### **(e) St. Thomas Sugar Company**

The ejector cylinder leaked and had to be repaired.

Overall, operations at core samplers were satisfactory. As a result of low downtime, levels of testing were high, ranging from 72.39% at St. Thomas Sugar Company to 99.28% at Monymusk. Industry standards require a minimum of 50% of samples taken to be tested.

## 2. Preventative Maintenance

### a) Laser Alignment

Laser alignment of steam turbines and power alternators was carried out at Appleton, Frome, St. Thomas Sugar Company, Monymusk and Worthy Park.

### b) Dynamic Balancing

Dynamic Balancing of boiler fans and centrifugal baskets was carried out at Frome, Appleton, St. Thomas Sugar Company, Worthy Park, Long Pond, Monymusk and Bernard Lodge.

### c) Ultrasonic Thickness Testing

This service was utilized mainly by Worthy Park and St. Thomas Sugar Company.

### d) Ultrasonic Flaw Detection

This was carried out at St. Thomas Sugar Company.

### e) Vibration Measurements

Vibration measurements were done at Worthy Park, Frome, St. Thomas Sugar Company, Monymusk, Bernard Lodge, Long Pond and Appleton.

## 3.0 Special Projects.

- (a) Fabrication of eight high pressure filtration units requested by the Sugar Technology Section to be used in core laboratories for polarimetric measurements by NIR spectrophotometry was undertaken. The units will be completed and available for use in the coming year.
- (b) A defective cylinder for the servo balans in use at the Ocho Rios port was repaired..
- (c) A tribological and corrosion study into the life of **mechanical harvester base cutter blades**, using two thermal spray coating techniques (High Velocity Oxy Fuel and Electric Arc Spray) undertaken in collaboration with the Engineering Department of the University of Technology has been completed. The main objective of the study was to develop a method for extending the life of the harvester blades. The study involved the use of two thermal spray (HVOF and Electric Arc spray) coating techniques. A paper on the results of the project was presented at the Jamaica Association of Sugar Technologists (JAST) Conference in November 2008.

#### 4. **SUGAR TECHNOLOGY**

##### (a) **Survey of Molasses, Sugar and Mixed Juice for Starch and Dextran Levels**

A survey of the levels of starch and dextran present in process streams, mixed juice, molasses and sugar was conducted to determine the quantity of these compounds entering and these process streams.

Tests were done on monthly composites of daily samples of mixed juice, molasses & sugar samples collected from February to June 2008 from four Sugar Factories, Appleton, Frome, Monymusk, and Worthy Park. Analysis of dextran was done using the Midland Antibody Method for the Rapid Dextran Test and the Modified Haze Test by SPRI. Starch was determined by the SASTA starch method.

The results showed that Appleton Estate averaged the lowest Dextran in mixed juice and raw sugar for the five month period (1121ppm/brix and 490 ppm/brix respectively). The dextran levels recorded at Frome (1004ppm/brix and 3212 ppm/brix) were the highest for sugar and molasses. Starch values were the highest at Worthy Park for all three streams (288 ppm/brix, 12,636ppm/brix and 718/ppm/brix for sugar molasses, and mix juice respectively. Appleton Estate recorded the lowest starch levels at the mixed juice and sugar stages (400ppm/brix, 128ppm/brix).

The four factories that participated in this survey all used a biocide to reduce bacterial proliferation. The usage varied according to the type of Biocide, Pesticide Control Service (PCS) or Cane Milling Aid (CMA) and the capacity of each plant. Only three of the four factories utilized amylase and dextranase.

##### 3.3 **Comparative Evaluation of Clarifying Reagents (Octapol and Lead Sub-Acetate) for Use With Masseccutes and Molasses.**

Due to the adverse health concerns associated with the prolonged use of lead containing products, the Sugar Industry Research Institutes has sought to employ suitable and efficient alternatives for use in the Sugar Industry. One such alternative in use for juice is the clarifying reagent, Octapol.

The study compared the use of Octapol and Lead subacetate for pol determination in highly coloured process streams syrup, A, B, and C masseccute, and final molasses. Comparative experiments were conducted using both filter aids to determine the suitability of Octapol, as a substitute for lead subacetate.

The results showed Octapol to be a good substitute for lead subacetate. Octapol use resulted in good filtration rate and high filtrate clarity. However, Pol values obtained using Octapol were generally lower than those obtained from the use of lead subacetate.

The manufacturer's recommended quantities of reagent for each substance were as follows:

A-MASSECUITE	5-6g
B-MASSECUITE	6-8g
C-MASSECUITE	8-10g
FINAL MOLASSES	10-15g

Recommendations based on experimental data are as follows:

SYRUP	4-6g
A MASSECUITE:	6-8g
B MASSECUITE:	8-10g
C MASSECUITE:	11-13g
FINAL MOLASSES:	16-18g

Based on the results of the trials using procedures recommended by the manufacturer of Octapol, experiment showed that higher levels of Octapol were needed to get acceptable results. With larger quantities of Octapol, differences between the results when compared to those from lead subacetate, showed fluctuations in the pol values. These values were as low as 0.03° in final molasses to 2.56° in "C" massecuite.

#### 3.4 **Factory Extension Services**

#### 3.5 **Collaborative Sugar Tests**

Three collaborative sugar tests were conducted over the cropping period. The general objectives of the test were to:

- (a) conduct a comprehensive evaluation of the performance of all factory laboratories with respect to sugar pol and moisture analyses.
- (b) standardize the methods of analysis and equipment.
- (c) provide technical support to laboratories to ensure the highest level of accuracy and precision.
- (d) establish acceptable limits from data produced using statistical techniques.

The results showed that pol measurements determined by the SIRI Central laboratory were slightly lower than the overall industry average. Most laboratories produced fairly accurate results with reasonable precision. Results for moisture were more precise than those for pol. Most laboratories produced results with good precision and accuracy although a few continue to produce results that are excessively above or below the average. The cause for these deviations are being determined for correction. .

### 3.6 **Collaborative Cane Tests**

Three collaborative cane tests were carried out over the duration of the crop. The objective of the test was to ensure that all core laboratories were operating within guidelines set out by the Sugar Industry Control Act. Attention was given to the juice analysis, moisture levels, fibre percentages and the level of cane preparation (PI).

The JRCS values for all three tests resulted in fairly large standard deviations, beginning at 1.3 and improving slightly as the crop progressed to 1.04. The efficiencies of shredders in cane preparation, open cell (preparation index) analyses, showed that all the shredders at the core samplers operated above the minimum standard preparation index of 80 %. The minimum preparation level recorded was 80.74% while a maximum of 96.99% was recorded at one factory on the third test.

### 4.0 **Factory Extension Services**

#### 4.1 **Core Laboratory Training Seminars**

The 2008 training seminars were conducted at six of the seven factories. All seminars were very successful and saw full participation from core laboratory staff. Topics covered in the seminars included :

- A review of the 2006/2007 core laboratory performance
- Preventative maintenance at the core
- Use and care of core laboratory equipment
- Introduction to and demonstration of High Pressure Filtration units to be used in pol determinations by NIR Spectrophotometry

#### 4.2 **Best Performing Core Laboratory**

Each core laboratory was evaluated at least four times cumulatively during the course of the crop to determine the best performance. From the results the core laboratory at Appleton Estate scored the most points while that at Monymusk was runner up.

#### 4.3 **Best Kept Factory**

Each factory was evaluated at least four times cumulatively during the course of the crop to determine the best kept factory. From the results Appleton Estate accumulated the most points while Trelawny Sugar Company accumulated the least.

#### 4.4 **Assessment of Starch in Mixed Juice, Clarified Juice and Syrup for Appleton Estate**

Starch analysis was conducted on samples from Appleton Estate to help the plant establish the efficacy of their amylase treatment program. The results have been transmitted to the Estate for evaluation.

#### 4.5 **Implementation of NIR Technology at Core Laboratories**

A core laboratory trial for pol determination using an NIR unit in conjunction with a high pressure filtration unit was conducted at the Frome core laboratory (April 1-4, 2008). Preliminary assessment of the data shows a correlation of 0.988 with 200 data points.

#### 5.0 **INSTRUMENTATION DEPARTMENT**

5.1 The Department undertook the following New Projects:

1. Spearheading conversion of an old Rodan type truck scale at Marcus Garvey Sugar Warehouse to the new Rocker Column type.
2. Designing and building a timing control circuit for sugar samplers.
3. Building a 962 model Fairbanks display unit to replace a defective unit at Worthy Park.
4. Building a 962 model Fairbanks display unit for Appleton Factory.
5. Repairing a serial interface board for Worthy Park's Fairbanks scale.
6. Replacing a broken cylinder for the export scale at the Ocho Rios port with new cylinder. The broken cylinder was repaired to be kept as spare.

5.2 Routine Services offered by the Department included:

1. General maintenance of Servo Balans scale at Ocho Rios.
2. Servicing all sugar samplers at the factories.
3. Servicing and calibrating truck scales for certification.
4. Assisting in certification of truck scales
5. Servicing and calibrating instruments in the Central Laboratory and issuing Certificates of calibration.
6. Servicing and calibrating all Bagging scales.

7. General repairs to Truck scales including that at the Marcus Garvey Drive Sugar Warehouse.
8. General maintenance of Servo Balans sugar and juice scales.
9. General Service of all core laboratory instruments including Ovens.
10. General Service of Factory laboratory Instruments.

## **6.0 Environmental Monitoring and Management**

### **6.1 Wastewater Monitoring**

The monitoring of the trade effluent from sugar factories was done in accordance with Section 17 of the NRCA Act 1991. The Act requires that all facilities that discharge effluent to a river, stream, sinkholes or land should report to the NRCA on both the qualitative and quantitative aspects of their effluent. The Institute continued the program of collecting and analyzing wastewater from sugarcane processing on behalf of all sugar factories. The wastewater quality for all factories continues to be in violation of the NRCA standards for trade effluent.

Despite the efforts made at the Appleton Sugar factory to improve the effluent going to the Black River, the quality of the final effluent continues to be out of compliance with the NRCA standards with respect to Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). The pH value was also out of range presumably due to the release of hydrogen sulphide from anaerobic activity. The 2007/2008 crop result for all the other factories also indicates very high BOD and COD values.

### **6.3 Meetings**

The NRCA Air Quality Regulations came into effect in July 2006. Sugar factory owners/operators were required to apply for their licences before December 31, 2008.

Environmental Committee Meetings were held at some factories to discuss the criteria for the licence application. Factories were encouraged to start the application process in order to meet the year end deadline.

## **Central Services**

### **Economics and Statistics**

The Department has been assigned responsibility to manage and monitor the various GOJ loan programmes disbursed through the Sugar Industry Authority for replanting and ratoon maintenance.

**SIA Loan Programme:** Since the inception of this programme in mid-2007, some 539 cane farmers received loans to undertake either replanting and/or ratoon maintenance. The programme facilitated the replanting of some 2 762 hectares and, with selective operations in ratoon fields, impacted some 11 844 additional hectares across the industry. Consequent on satisfactory completion of field operations disbursements amounting to approximately \$160.3M were made, *Table 1*.

**Table 1: Approvals and hectares funded, 2007 and 2008, Government Funded Loan**

	No. of Farms	Total (\$M)	Hectares Completed
Ratoon Maintenance	295	56.716	9 082
Replanting 2007	60	17.048	1 137
Replanting 2008	182	83.749	1 625
Equipment Loan	2	2.792	
Grand Total	539	160.305	11 844

Owing to the late start of the programme in 2007, only a limited quantity of replanting was achieved and the bulk of disbursements went towards ratoon maintenance. Since January 2008 however, the emphasis shifted to mainly replanting.

Extremes in the weather and shortages of tillage equipment and recommended planting material were among challenges faced by the programme.

**Drip Installation and Farm Machinery:** The programme facilitated the installation of drip irrigation infrastructure on one farm in Clarendon. More fields were expected to be brought under the programme.

With disbursements totaling \$2.72M, the programme also facilitated purchases of a few pieces of harvesting machinery in the Trelawny area; and a boom sprayer in the Frome area. The use of the boom sprayer would not be confined to the specific farm but would be utilized in assisting other farmers in weed control operations.

**Repayment Deferral:** To alleviate financial stress experienced by growers resulting from sharp increases in fertilizer prices, a ministerial directive was given that all repayments on loans due in 2008 would be deferred until the following year.

**Cane Expansion Project:** Further funding to enable the industry to increase cane production through sustainable increases in productivity and efficiency were considered under a Cane Expansion Project. Funds for replanting would be in the form of loans while funds allocated for Drip Irrigation Infrastructure and Regional Drains would be grant funded. Procedures by which the project would be administered are to be finalized.

**Cost of Production Survey:** The Department undertakes, on an annual basis, a Cost of Production Survey to track the cost of producing and harvesting among cane growers. Data collection on the 2007/08 crop was near completion, to be followed by data entry and analysis.

**Cane Yield Survey:** The cane yield survey is an annual project undertaken by the Institute. The survey provides information on production and productivity, in addition to information on hectares in cane, tonnes cane produced, fertilizer and water used etc within the cane industry. Data obtained are used to monitor the variety performance, determine sugar production per hectare per month and to derive other indices of productivity. Compilation of the 2008 Survey was in progress.

### **Information Systems**

The SIA loan programme was rewritten and extended to include two other loans, namely, the SIA Equipment and the SIA Estate loans. The Central Laboratory programme was also completed and both applications deployed for user acceptance testing.

General system support was provided for all users, including those at the Core laboratories, Ocho Rios and Marcus Garvey scale units, SIA, SPF and the SIRI and Bernard Lodge and Frome offices. Additionally, computer/printer maintenance/repairs/rebuild and network maintenance was done across the institute. Software training was also carried out with the emphasis on MS Excel, MS Word and WordPerfect along with general file management techniques. Multimedia support was provided across the institute to facilitate conferences, out-of-crop and pre-crop training.

The Cane Farmers Registration (CFR) Programme being used at SIA, is still being worked on, but is already being used for the registration of farmers. It is now at the point where data for weights are to be accumulated and added to the system. No problem with the weight accumulation process is anticipated.

### **Central Analytical Laboratory**

The Laboratory continued to support the activities and projects of both the Agricultural and Factory Services Divisions. Routine analysis on wastewater from the factories, water for irrigation purposes, soils, plant tissue, fertilizers, cane juice, sugars and molasses continued during the period under review. A total of 15,769 analyses were performed.

### **Sugar Quality 2008**

The average pol for the industry was 98.16°, showing an increase of 0.02 over last crop. The safety factor of 0.20 was well within the specification of not more than 0.30. The industry-wide average for dextran was 378mau showing considerable improvement over the value of 612 mau for the last crop. The average value for reducing sugars was within the specification of less than 0.70% and values for both raw and affined colour were within the specification of 3000 and 1500 IU respectively.

## **Molasses Quality 2008**

The results obtained for the analyses of molasses showed that there was room for improvement in the exhaustion of final molasses at all the factories.

## **Wastewater Analyses 2008**

The routine analysis of wastewater was conducted in the normal fashion. The results for the samples analysed, showed biochemical oxygen demand (BOD) and chemical oxygen demand (COD) were always much higher than the standard of 30 and 100 ppm respectively, even values for the out-of-crop period; whereas the other parameters only sometimes exceeded the specification as set out by the National Environmental Planning Agency (NEPA) for wastewater from factories. Nitrates and sulphates were usually within the specifications of 5 and 250 ppm respectively, however those for phosphates generally exceeded the standard of 5 ppm. Usually oils are absent.

## **ISO 17025**

The laboratory continued to maintain the procedures and systems required for accreditation.

## **HPLC**

Research into using the high performance liquid chromatography (HPLC) as a tool for variety improvement and selection is being carried out. Preliminary investigations showed that there is some correlation between HPLC results and wet chemistry methods and should allow identification of markers which will permit the selection of varieties with the characteristic traits best suited to meet the needs of the industry. Overseas and local training was sought to increase the competences available in the laboratory.

## **Heavy metal analysis**

Investigations to determine suitable methods for determining cadmium and lead concentrations in soil and leaf samples using the atomic absorption spectrometer (AAS) were undertaken. Approximately 62 samples (32 plant tissue and 30 soil samples) were examined. Preliminary results showed that the methods examined, dry ashing and acid digestion of tissue samples were required modification. Further work will be done to improve on the method of extraction. Preliminary investigations for determining total dissolved cadmium and lead in soil samples were positive but further work needed to be undertaken to allow for accepted status.

## **ICUMSA**

There was continued participation in and support of ICUMSA's activities. A review of the work to be carried out by the 'Oligosaccharides and Polysaccharides' Committee was forwarded to the Referee by the Laboratory for the meeting in Florida, September 2008,

and included collaborative studies on starch and dextran analysis specific to raw sugar as there was a need in the Jamaican sugar cane industry for quick and reliable methods. There were other contributions made by the laboratory for the preparation of reports from the 'Molasses', 'Indirect Methods of Analysis', and 'Density, Optical Rotation and Refractive Index' Committees.

There are eight methods for use in the trade of raw sugar to determine payment and quality. Methods for polarisation, reducing sugars, ash, moisture, colour and dextran have Official status and those for starch and fine grain, Tentative status. Recommendations were made at the meeting for Method GS1-16, 'The analysis of starch in raw sugars' to be given Official status and for work to proceed on collaboratively testing of GS1- 20 or another method for the analysis of fine grain, MA and CV in raw sugar. The Molasses Committee recommended studies on Draft Method "The Determination of Apparent Total Sucrose from Sucrose, Glucose, and Fructose in Molasses by an Enzymatic Method." and for efforts to improve the stability and shelf-life of the enzymes to be undertaken. Another recommendation was for further studies to determine the suitability of NIR for routine monitoring of molasses.

The Oligosaccharides and Polysaccharides Committee recommended GS1-15, 'Dextran in Sugars by a modified Alcohol Haze Method' be rewritten to include proper precision data for white and plantation white sugar and for a collaborative test to be done using all four methods available for the determination of starch. Recommendations from the Cane Sugar Processing Committee included a proposed study of "non-lead clarification methods for analysis of sugar cane processing stream products", selection of a method for analysis of colour of sugar cane stream processing products and a method validation study for SO<sub>2</sub> content in sugar processing products

It was also recommended that a method validation study of the Vasantdada Sugar Institute (VSI) method for starch and Sugar Cane Research and Training Institute (CERF) method for non-lead clarification methods for pol analysis of sugar cane stream processing products (ICUMSA draft method No. 9) be carried out. The use of thick filters is recommended as this permits better filtration quality resulting in steady polarimeter reading. A recommendation was made that the scope of method GS1/3-7 (2002) be extended and should to include the determination of colour in raw sugar, plantation white, refined and partly refined sugar, brown sugars, coloured syrups and cane sugar processing intermediate products such as clear juice, syrups, masseccutes.

## **PUBLICATION LIST**

The Caribbean: Integrating biofuels into existing agricultural systems' CTA Seminar 2008, Burkina Faso, Africa, October 2008

'The Caribbean: Increasing Competitiveness of the Sugar Industry through Biofuels' SPRI Conference, Delray Beach, Florida, September 2008

'Caribbean: Advancing a Sustainable Biofuels Industry', Biofuels Markets Americas

Conference, Miami, USA, May 2008.

A presentation of the draft policy document, 'Biofuels: ACP's response to fossil fuel dependence', written by: Jan Cloin, Raymond Rivalland, Dr. Maureen Wilson and Prof. Francis Yamba; edited by Judith Francis. CTA, Wageningen, Netherlands, to West Indies Sugar Technologist Conference (WIST), Montego Bay, Jamaica, April 2008.

Policy Coherence for Development in Biofuels: Mitigating against Climate Change', paper presented at EU PCD Workshop, Brussels, January 2008

Other highlights of the Institute's work in sugar cane agriculture are reflected in the range of papers presented at the annual conference of the Jamaica Association of Sugar Technologists:

Monitoring of biological control of the sugar cane stalk borer, *Diatraea saccharalis* in Jamaica - by T Falloon

Water quality trends in the Clarendon plains and implications for cane growing – by L White

Decision support for cane growers faced with rising fertilizer prices – by C Fearon

The SIA replanting loan programme - A managed approach to crop lien credit – by C Woolery

Experiences with the cane thumper harvester – by A Wright & L White

Harvesting: A challenge to high JRCS and sugar recovery in the Frome area – by P Wright, A Simpson and W Fray

A quantitative evaluation of yield gains in the variety selection programme in Jamaica – by U Green & K McPherson

Adaptation and yield stability of leading sugar cane varieties in Jamaica – by M Bennett-Easy

Investigating bagasse/rice hull as a medium for the production of tomato and sweet pepper – by Y Bryan & M Bennett-Easy

## **WORLD SUGAR SITUATION**

The sugar market for 2007/2008 was torn between the extremes of euphoria and depression. In January 2008 sugar price in New York reached US13.75 cents compared with US11.85 cents in the previous year. The price increased further in February to US15.16 cents. Four major reasons were identified for the fairly strong development of sugar prices:

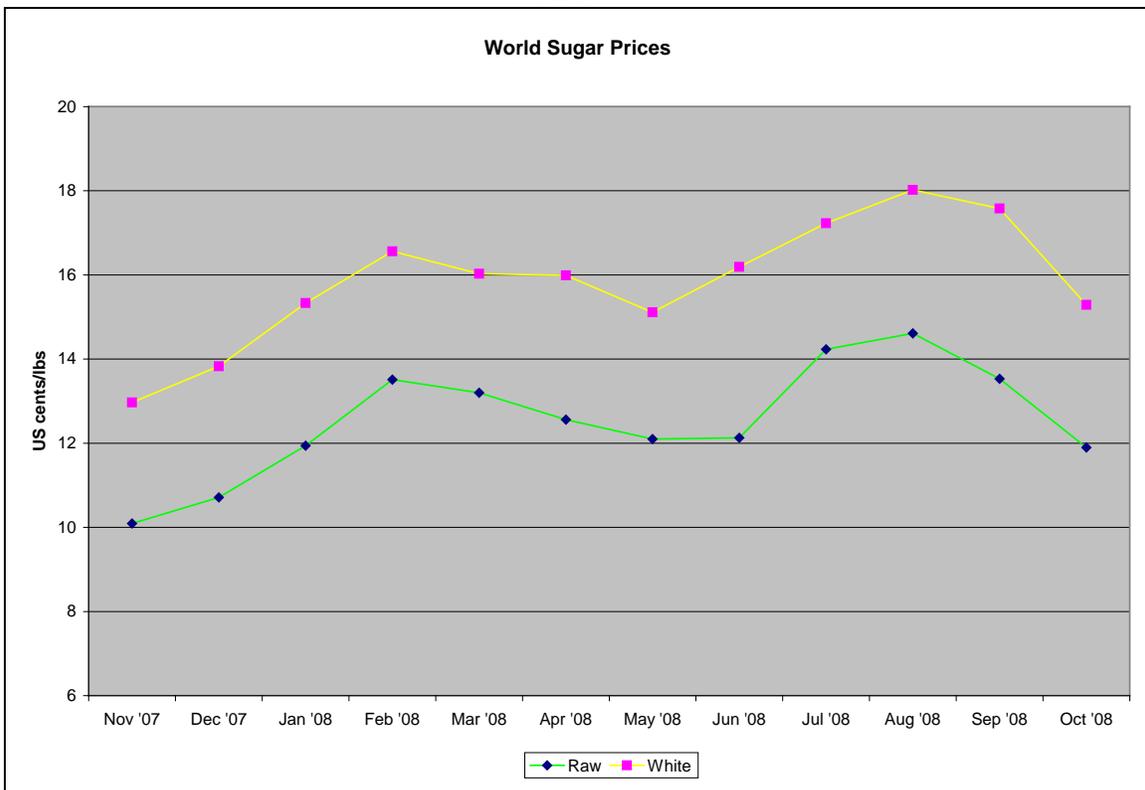
- The weak US dollar led to an increase in the minimal price of dollar denominated commodities as it made them cheaper for importers, while increasing dollar denominated production cost for producing countries.
- Oil prices above US\$100 per barrel led to the belief that higher ethanol production in Brazil would reduce the country's sugar production in 2007/2008.

- Low returns for other assets classes such as stocks and bonds led to a reallocation of funds and a considerable inflow of money into commodities markets.
- A reduction in the production forecast for India and frost in China in February 2008 led to predictions that the surplus in 2007/2008 could be lower than expected.

All the above strengthened the belief that prices would remain attractive. Given the rosy outlook for sugar and ethanol, ample investment was available, which led to an investment boom mainly in India and Brazil. Unfortunately, investment in the sector lacked a sense of proportion which, coupled with almost ideal weather conditions around the globe, led to a strong increase in sugar production. Consequently, production once again exceeded demand in 2007/2008 with surplus stocks rising by another 2.6 million tonnes.

In April/May sugar prices came under renewed pressure exposing the market's underlying weakness. The fundamental problem behind this story was clear: Too much sugar chasing too few homes. The build up in stocks came as a disappointment to industry and growers alike. The disappointment was all the greater as nearly all other commodity markets boomed, sugar clearly proved to be an underperformer. There seemed to be no light at the end of the tunnel given the huge sugar surplus overhanging the market. No relief is expected before the second half of 2009.

Chart 4



## **THE EUROPEAN UNION**

The new Common Market Organization (CMO) which took effect on July 1, 2006 worked satisfactorily with only some minor hiccups. The goal of a quota reduction of 6 million tonnes has almost been reached so no linear quota cut at the end of the restructuring period seems to be needed. As a result, EU farmers reduced the area under beet to 1.57 million hectares in 2008 compared with 1.67 million hectares the previous year, only half the area ten years ago. Beet production ceased in five of the least efficient member countries, while there was significant reduction in six States. The number of factories declined from 188 in 2005/2006 to 108 at the end of 2007/2008.

Farmers hopes pinned on fuel ethanol production will not fully materialize and cannot halt or even reverse the decline in area. There were 16 operational beet distilleries in 2008 ensuring one third of ethanol production for fuel utilization. Only 10% of the total beet area was used for ethanol beet with farmers expecting that figure to rise to over 260,000 hectares in 2015, depending on 10% mandatory blending in 2020.

Fuel ethanol produced in the EU is not competitive internationally and needs state protection, that is, specific measures to balance trade.

The Commission predicts that community sugar production will level off at 13 million tonnes in white value terms, while imports are expected to double from 2.5 – 3.0 million tonnes to 4.5 million. EU exports are forecast to shrink drastically to a maximum of 1.3 million tonnes (the WTO upper limit) compared with 5-7 million tonnes before reform.

Unclear at this stage is how the EU Market will connect with the world market. Given the significantly lower internal price, preferential exports to the EU will lose some of their attractiveness. Much will depend on world market prices, freight rates and the Euro/Dollar exchange rate.

Trade sources have already warned that with prices in the EU falling by 36% and with the global market price for sugar expected to rise in line with the cost of production over the medium term, the reform programme could expose EU consumers to supply volatility. While supply gaps within the EU are an unlikely scenario, it should not be forgotten that EU import demand was a key element in the sugar price boom in 1974.

### **OUTLOOK FOR 2008/09**

Global sugar production for 2008/09 could be around 160 million tonnes, roughly 8 million tonnes less than production in the previous crop. Although this figure contains an element of uncertainty, the question is whether such a decline will lead to a reduction of excessively high stocks and a healthier fundamental picture. This will not least depend largely on global demand.

Sugar consumption is one of the most important determinants for the future of the global

sugar market. Growth is subject to a number of factors which do not have the same impact in all places. Just to recall, the most important are:

- prices of sugar and alternative sweetener
- per capita incomes
- population growth
- sugar availability
- consumer preferences
- technological advances
- government policies

From a fundamental perspective the global demand is likely to remain weak given the bleak economic perspective.

The credit crunch may affect Brazil's crop, while the Indian industry may need a year with a large deficit and high prices to move into forward gear. The scarcity of working capital may affect production in other countries as well. Hence 2008/09 could see a deficit despite continued sluggish demand which could lead to an improved fundamental picture. However stocks are still abundant so from a fundamental point of view no major upswing seems in sight barring adverse weather conditions.

#### **WORLD SUGAR PRODUCTION 2008/09**

<u>Production Area</u>	<u>Tonnes (mln)</u>
Europe	22.6
Africa	10.9
North & Central America	19.5
South America	42.6
Asia	60.5
Oceania	5.2
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TOTAL	161.4
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Director

Mr. Harold Brown  
Director

Mr. Astil Sangster  
Director

Mr. Peter Haley  
Secretary

## 2008 SALARIES & EMOLUMENTS SENIOR EXECUTIVES

POST	TOTAL	REMARKS
CONTRACT OFFICERS		\$
1. Executive Chairman	4,900,000	Plus Gratuity & Motor Vehicle
2. Director of Research, SIRI	3,266,496	Plus Gratuity Motor Vehicle & Lunch Allowance
3. Director, Finance & Administration	3,334,293	Plus Gratuity Motor Vehicle & Lunch Allowance
4. Factory Services Manager, SIRI	3,114,000	Plus Gratuity Motor Vehicle & Lunch Allowance
OTHER SENIOR EXECUTIVES		
1. Agricultural Service Manager	4,198,407	Plus Motor Vehicle & Lunch Allowance
2. Information & Planning Manager	3,401,457	Plus Motor Vehicle & Lunch Allowance
3. Head, Extension Services	3,031,059	Plus Motor Vehicle & Lunch Allowance