

Sugar News

NUUESTRA INDUSTRIA AZUCARERA

Sugar Industry News | VOL. 4

2015 Sugar Cane Crop Opens!



The 2015 Sugar Crop Season began on January 26th 2015 with the live airing of the Sugar City Morning Show from outside the gates of the Tower Hill factory. On the show, BSI representatives, the three associations and the Minister of Natural Resources discussed the opening of the crop and the needs for the future of the Sugar Industry.

At exactly 10:00 am, media and stakeholders gathered at the factory gates to witness the first truck rolling in, that of farmer Hermentino Coyock Jr. Some stakeholders and the media then proceeded inside the factory to witness the start of the grinding phase.

The opening of the crop season marked a day of jubilation for all interested parties as well as a new beginning within the Sugar Industry with the participation of two new associations, the Corozal Sugar Cane Producers Association and the Progressive Sugar Cane Producers Association.



Cane truck unloading via the Dumper Table at the Cane Yard

Throughout the day, farmers received snacks under a tent garlanded with balloons and music, signaling the momentous occasion of this day.

Mac McLachlan, Vice-President of International Relations, expressed the company's pleasure at starting the season, "We're very happy this day has come. We're happy to be moving on with the crop. It's time to do that. I hope that this goes down as a success story for the industry in the future, where through difficult times, we can now move forward together."

BSI aimed at receiving six thousand tons of sugar cane for the first day and it was reported in BSI's Information Bulletin, that the quality of cane delivered was impressively good with the tons of cane per tons of sugar being below ten.

BSI ASR is pleased with the start of this new crop season and believes that there is only one direction to head into and that is forward.



ASR GROUP | BELIZE SUGAR



Stakeholders of the Sugar Industry at the Sugar City Morning Show



Farmer, Hermentino Coyock Jr. delivering the first truck load of cane



Mac, McLachlan, Vice-President of International Relations & Olivia Avilez, Cane Farmers Relations with farmers at the Cane Yard



Mechanical Harvesting: Monitoring and Improving Quality



"All stakeholders in the Belize Sugar Cane Industry recognize that harvesting efficiency needs to improve as a way to make this business sector more competitive and sustainable. This requires a collective effort, with new and innovative approaches to maximize productivity. This will only be achieved with team work, collaboration, and under the review of a task force of interested parties."

The sugar industry of Belize has traditionally relied almost exclusively on hand cut harvesting. This has been a proven and reliable system over the years, bringing employment and prosperity to the area. However, there are a number of challenges moving forward. The total labour force available for manual harvesting has decreased at the same time that it fluctuates during the season. Over the years cane cutting costs have increased reducing net income to farmers. Shortage of local cutters has forced some growers to seek immigrant labour sources, however this alternative adds additional stress and cost to an already struggling social economical system.



Mr. Modesto Ulloa, Agriculture Consultant for ASR, speaking about BSI's Chopper Harvester Operations

With this in mind, a project under the title of, "Monitoring and Improving Quality to Prepare for Expansion of Mechanical Harvesting" was developed to identify the strengths and weaknesses of mechanical harvesting and to come up with best management practices suitable that will improve cane quality throughout the Belizean Sugar Industry.

Field visits of BSI's chopper harvest operations were organized for leaders of the associations to become familiar with the project and move forward with the mechanical cane harvesting discussion for the Strategic Development Plan. All associations agreed to nominate a member to the task force and the first meeting was held on Tuesday February 10th, 2015. Representatives from the Progressive Sugar Cane Producers Association, Corozal Sugar Cane Producers Association, Sugar Industry Research & Development Institute, Sugar Cane Production Committee and BSI were present for the meeting.

Mr. Modesto Ulloa, Agriculture Consultant for ASR, presented a monitoring protocol for cane quality and extraneous matter to address recording practices in the field. The agriculture research team at BSI, along with the quality personnel from SCPC, will be responsible to conduct sampling 4 times a week and issue the results. These results will be compiled, reviewed and shared with the task force at monthly meetings.

Task force members agreed to conduct a task force field visit to see the monitoring protocol in effect and schedule dates throughout the year for additional farmers to see the mechanical operations. All agreed that this project is important for the future of the Sugar Industry and pledged full participation and support since they are aware that it will contribute to the Strategic Development Plan and bring benefits to all stakeholders in the Sugar Industry of Belize.



Mechanical Task Force holding their first meeting on February 10th, 2015 at the BSI Factory Conference Room



FROM Sugar Cane, TO Sugar Crystals

THERE ARE SIX BASIC PROCESSES INVOLVED IN SUGAR MANUFACTURING:

1. Preparation
2. Extraction
3. Clarification
4. Evaporation
5. Crystallization
6. Separation

You can find our Previous Articles in Previous Volumes: Preparation in Issue #1, Extraction in Issue #2 and Clarification in Issue #3



Color of Squeezed Cane Juice (cloudy and highly acidic)

CLARIFICATION OF CANE JUICE

Visitors at the sugar factory are generally surprised to see the color of cane juice after it has been squeezed from the cane: it is cloudy and highly acidic. This is the raw material that must be converted into sugar crystals in the Boiling House.

But firstly this impure juice must be treated. The aim of this process is to produce a clear juice by removing the maximum amount of impurities (both dissolved and suspended) and to raise the pH enough to minimize **inversion losses** and prevent color formation during subsequent processing. *Inversion is a common term in sugar manufacturing, which means that the sugar in the cane is being fermented by bacteria.*

There are two important steps in clarifying cane juice; the first is to raise its temperature to 218 degrees Fahrenheit by passing it through pressurized juice heaters where steam or vapor is used as the heating medium to increase the juice temperature.



Pressurized Juice Heaters which raise temperature of cane juice to 280° Fahrenheit

The second phase is to add white lime (calcium oxide) in solution to the hot juice to attain a pH of 7.5 -7.8. This hot, pressurized juice is then exposed to atmospheric pressure in an open vessel called a flash tank where it "flashes", releasing all air bubbles adhering to the bagacillo (fine fibre from sugar cane) that comes with the juice. This vessel also assures a more uniform temperature in the clarifier.



Open Vessel called a Flash Tank which releases Trapped Air Bubbles



Specially Designed Sugar Research Institute Clarifier

As the juice enters this clarifier, it is treated with a flocculant (a substance that promotes the clumping of particles) which pulls the mud and bagacillo particles together to form large loosely clumped masses that settle at the bottom of the clarifier and the clear juice to overflow from the top.



Mud Filters used to remove Settled Mud

The clear juice is sent to an open vessel for processing, while the settled mud is sent to large filters to remove as much more sugar from it before being disposed of as filter press.

The next stage of the process is to begin the concentration of the clear juice through evaporation, which is the topic of our next segment.

Meet Tower Hill Mill Employees at the Boiling House



Amin Garcia



Malco Cabrera

Meet two of our **Process Utility Assistants** who assist as required to ensure the smooth operation of the Boiling House, Juice Heaters, Evaporators, Juice/Syrup Clarification and Mud Filtration section of the factory plant.

They are also responsible for making up the Cooling Tower with zero hardness water as required and of regenerating the water Softener.

Do We Know Our Sugar?



The Belize Sugar Cane Farmers Association has embarked on an educational Awareness Campaign with the theme "KNOW YOUR SUGAR" to our primary schools in both Orange Walk and Corozal Districts, in an effort to engage the generations that can have a meaningful impact in the future of the Sugar Industry. Despite being one of the pillars of our economy, the children and youth have very limited knowledge on how we arrive to the teaspoons of quality sugar that go in their chocolate milk, juices and soft drinks, and to a lesser extent the valuable role of each person

involved in the harvesting and processing of cane into sugar. The educational campaign is designed to take our children back to the genesis of how Sugarcane reached our country and how it has been evolving during time. It also includes Sugarcane physiology; early and modern methods of cane harvesting and processing. Moreover, it sheds light on the various interesting careers our children could pursue to ensure a viable sugar industry for our future.

The BSCFA is committed to working at ensuring the well-being of our youth and children; therefore every effort to attract our children to actively engage and participate in the sugar industry at their tender ages, is a step closer at guaranteeing a better future for their families and communities the day of tomorrow.



Field Officers, Angel Nicholson & Daniel Villanueva presenting at Mary Hill RC Primary School in the Corozal District



Luis Gongora, field officer, giving a presentation at Louisiana Government School in the Orange Walk District



Paving the Way for a Sustainable Sugar Industry: Strategic Development Plan



Sugar Industry Stakeholders signing Statement of Commitment

In addition to signing new cane purchase agreements, BSCFA, PSCPA, CSCPA, BSI and the Government of Belize have also signed a statement of commitment to develop and agree on a Strategic Development Plan to make the sugar industry of Belize sustainable into the future. What does this mean?

Belize has to become more competitive to survive as a sugar industry. Sugar is a global



Bulk Raw Sugar in BSI's Warehouse

commodity market. The prices paid for sugar are dictated by global demand and supply. In recent years, the supply from countries like Brazil, India and Thailand has meant there is a surplus of sugar in the international market. This keeps global prices low, to around BZ \$30 cents a pound, or US \$330 a ton of sugar. Belize is not immune to this issue. It cannot sell sugar for more than international markets are willing to pay. Also, the prices for sugar in the EU are falling, as the market prepares for increased supply of beet sugar in 2017.

The SDP will set out a road map for industry reform, to make sugar production more competitive. Belize is blessed with plenty of sugar land, committed cane farmers and an efficient mill. The SDP will cover issues such as how to improve the investment climate to enable the expansion at the mill to grind 1.8 to 2 million tons of cane. How to improve cane productivity – both cane yields per acre, and quality of cane. If yields on cane land are improved, even though sugar prices per ton of cane are falling, farmers will get higher revenues because they are producing more tons of sugar per acre than now.

Farmers will need support to achieve this, through access to affordable credit. The government has a role under the SDP to improve sugar roads and drainage. The efficiency of transporting the sugar from factory to ship needs to be improved. Solutions to all these issues need to be identified within the SDP.

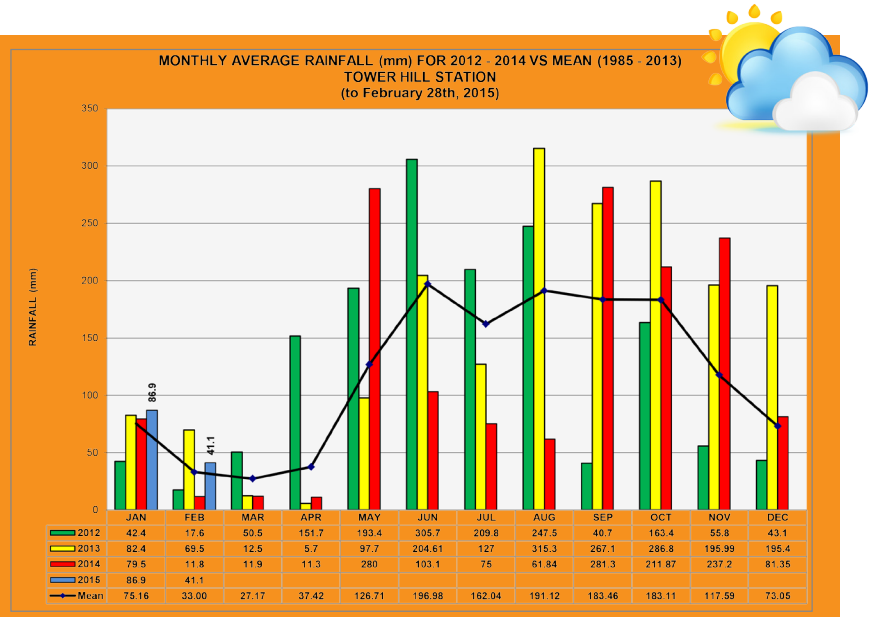


Improving Cane Productivity is one important item under the SDP

An SDP steering group has been formed, and representatives of all three associations, the mill and the government are meeting regularly to discuss these issues. Farmers will be able to participate in working groups to identify the challenges to all these issues. This is important because everyone in the industry will have a part to play in implementing solutions to overcome them, and if everyone plays their part, the Industry can flourish for the benefit of everyone.

MONTHLY AVERAGE RAINFALL

The graph shows rainfall recorded at Tower Hill in 2012, 2013, 2014 and up to February 28th 2015. As can be noted, there was a significant drop in rainfall from November to December 2014 of 155.85 mm of rain. Most of the rainfall recorded in December was at the beginning of the month resulting in unfavorable conditions for the scheduled start of crop on December 8th 2014. In January 2015, rainfall was marginally higher than in previous years. However, at the opening of the crop season on January 26th 2015, weather conditions were optimal since rainfall for the month was mostly recorded at the beginning of January. The month of February had recorded rainfall of 41.1 mm, resulting in more wet conditions for this 2015 ongoing crop season in comparison to last year.





BSI's Waste Water Treatment System

Sugar Cane is comprised of around 65 to 68% of water. Tower Hill Sugar Mill processes more water than sugar on a daily basis during the crop season. As a result, there is excess water produced which must find its way out of the factory through the waste water treatment system before being released into the New River.



Tanks with Effective Microorganisms

One of BSI's guiding principles is to be a socially responsible company which protects the environment and benefits the communities where it works. Therefore, the company has always been on the lookout to constantly improve the quality of waste water released by the factory.

Today, this treatment is achieved by biological means through the use of Effective Microorganisms (EM). These living organisms are naturally occurring bacteria such as yeast, lactic acid bacteria, and phototrophic bacteria. These EM improve the physical and chemical property of the waste water through fermentation, a biological process that breaks down organic matter. They are not genetically modified or engineered organisms and are considered very safe to animals, plants and humans.



Oxidation Pond #2

The wastewater treatment system is composed of five oxidation ponds (large ponds designed to treat wastewater through the interaction of sunlight, bacteria, and algae) and a cooling pond to ensure that water temperatures are adequate before being released into the river. Both of these processes have ensured that BSI reduces its impact on the environment by greatly reducing its water temperature levels and chemical water levels. This system has also proved to be cost effective, very efficient and has allowed BSI to achieve several improvements such as the ones in the table below:



Waste Water Streams

Environmental Parameter	Before (2009)	Today (2014)
Purification Levels	60 to 70%	90%
Chemical Oxygen Demand	250 parts per million (ppm)	50 ppm
pH	8.0	7.3

* Chemical Oxygen Demand measures the chemicals and compounds in a solution which consume oxygen. The higher the COD in the discharge, the less oxygen is available for aquatic organisms such as fish. National Requirements are 250 ppm

* The pH of river water is the measure of how acidic or basic the water is on a scale of 0-14. The optimum pH for river water is around 7.4



New River Behind BSI

Apart from the treatment with EM Technology, BSI also has a well-developed monitoring program. BSI conducts daily monitoring of its waste water by obtaining samples at 14 strategic points along its waste water stream. Additionally, BSI conducts monthly river surveys throughout the crop season where samples are taken at 13 strategic points along the New River. The results of these analyses are reported to the Department of the Environment on a monthly basis. The data that is obtained from the monitoring program is also analyzed and used by BSI to determine improvement opportunities.

All of these practices and programs of BSI's Environmental Management System serve to reinforce the company's commitment of being a socially responsible firm which effectively manages the waste water coming from the factory's operations.



Child Labour Laws for the Sugar Industry of Belize



dangerous equipment and work that involves abusive punishment or is exploitative. (Ref. FTSTD 3.3.9)

The minimum age requirement (18 years) also applies to children who are employed indirectly by the members, for example when children of workers are working with their parents in their fields. (Ref. FTSTD 3.3.7)

Children below 18 years of age but not less than 15 years are allowed to help members on their farms under strict conditions: members must make sure that they only work after school or during holidays, the work they do is appropriate for their age and physical condition, they do not work long hours and/or under dangerous or exploitative conditions and their parents or guardians supervise and guide them. (Ref. FTSTD 3.3.8)

Furthermore, all cane farmers must be reminded that our sugar is mainly for export to markets that are increasingly demanding in terms of accepting products that are free of child labour. Ultimately, the goal is to ensure a prosperous future for the Sugar Industry which can only be achieved with the well-being of our children and youth.



As the Sugar Cane Harvesting season is on full swing the Belize Sugar Cane Farmers Association would like to remind all cane farmers, particularly our BSCFA members, of the following highlights as per the International Labour Conventions, the Labour Laws of Belize, Fairtrade Standards and BSCFA Child Labour and Child Protection approved policy:










Must not submit workers of less than 18 years of age to any type of work which, by its nature or the circumstances under which it is carried out, is likely to jeopardize their health, safety, morals or their school attendance.

Examples of work that are potentially damaging includes work that takes place in an unhealthy environment, involves excessively long working hours, night hours, the handling or any exposure to toxic chemicals, work at dangerous heights, operation of

Tower Hill Mill Report 2015

For the 9 Weeks of Crop from March 23rd, 2015 to March 29th, 2015

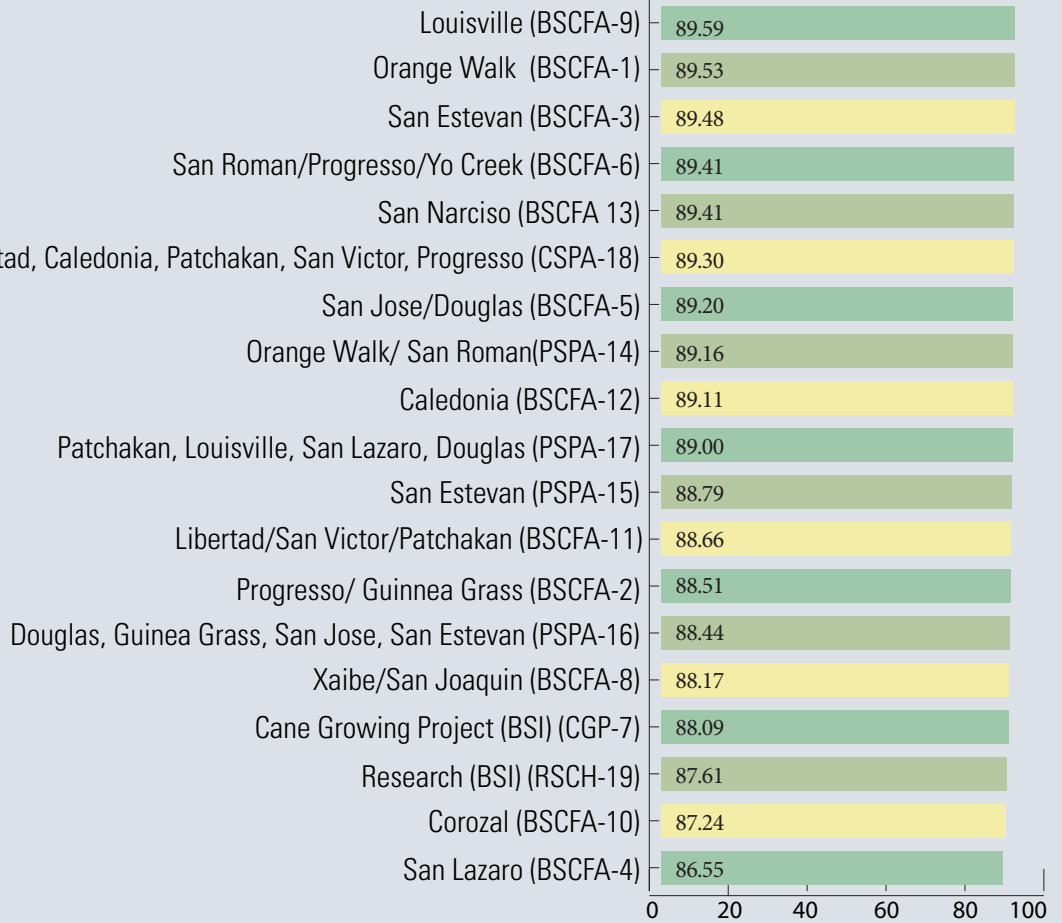

	Key Parameters	
	This Crop	Last Crop
	<i>Cane Ground (tons)</i>	
	467,380	479,222
	<i>Sugar Produced (tons)</i>	
	56,109	49,760
	<i>Grinding Rate (tons cane per day)</i>	
	7,419	7,607
	<i>Juice Purity (%) - 1st Expressed</i>	
	88.20	86.78
	<i>Tons Cane per Ton Sugar (TC/TS)</i>	
	8.33	9.63
	<i>Pol Extraction - Sugar Extracted from Cane (%)</i>	
	95.27	95.36
	<i>Factory Time Efficiency (%)</i>	
	97.48	95.42







Test Groups Purity Report - Cane Crop 2015

Corozal, Louisville, San Narciso, Libertad, Caledonia, Patchakan, San Victor, Progreso (CSPA-18)

SUGAR INDUSTRY OF BELIZE

Transforming Sugar Production in Belize into a Modern, Sustainable, Green Model, Contributing to Jobs, Growth and Energy Security

BSI/ASR's Contribution to the Strategic Development Plan

The Belize Sugar Industries is contributing to the Strategic Development Plan process with the launch of a strategy paper entitled: "Transforming Sugar Production in Belize into a Modern, Sustainable, Green Model, Contributing to Jobs, Growth and Energy Security." The strategy paper considers a range of inter-related challenges and potential solutions to overcome them to make the industry sustainable.

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HOW CAN I HAVE MY SAY?

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We want to hear from you! Let us know what you want in your newsletter.

