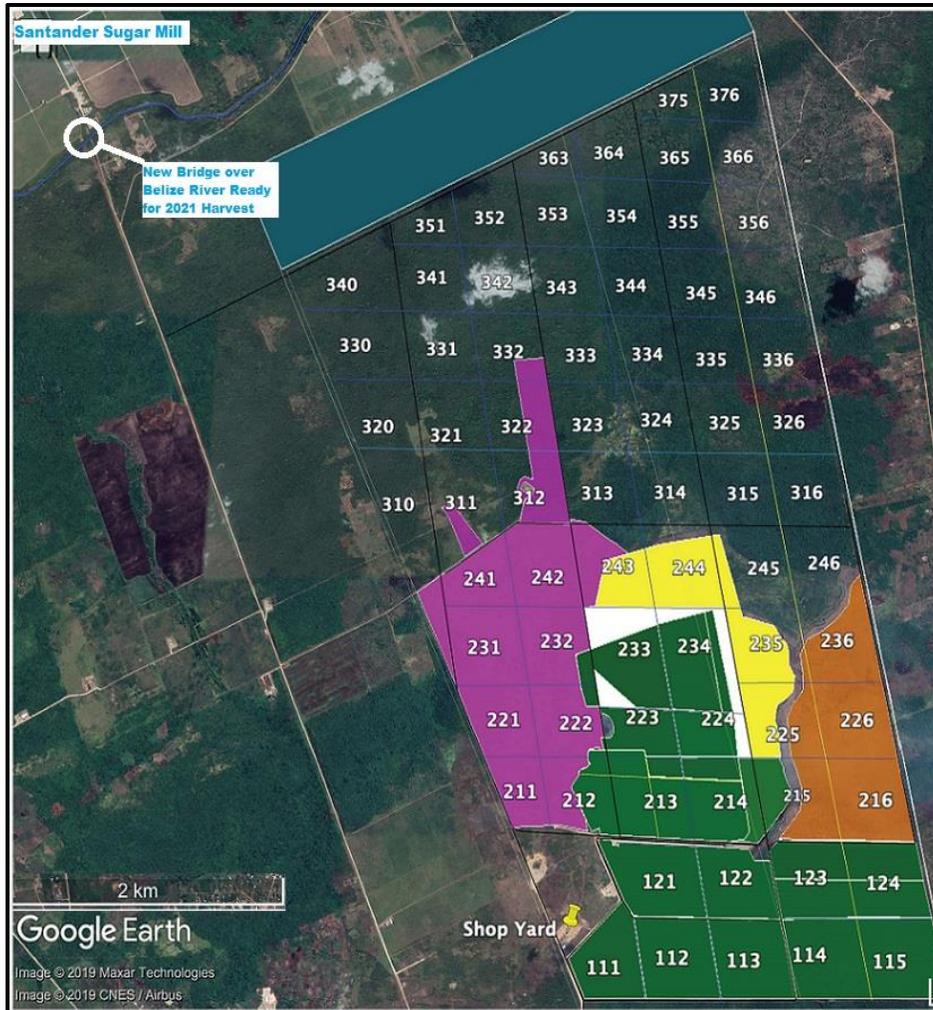


## Belize Sustainable Agriculture, Ltd. Farming Report – October 21<sup>st</sup>, 2019

This is the **First** Farming Report for BSA’s 2019/2020 Farming season, which going forward will be sent out four times during the year. Its main objectives are: 1) to inform readers about BSA’s sugarcane farming activities as well as provide data on BSA’s farming methodologies; 2) to provide data on climactic conditions, agricultural pests, and market conditions.



Description	Ha
Planted 2020 Commercial Harvest	<b>367.4</b>
Ready for 2019 Planting (if possible) 2020 Harvest for Seed	<b>30.2</b>
2020 Planting (early) 2021 Commercial Harvest	<b>61.0</b>
2020 Planting 2021 Commercial Harvest	<b>97.9</b>
2020 Planting (late) 2021 Commercial Harvest	<b>216.5</b>
2020 Clearing 2020 Land Prep. (~400 Ha) 2020 Planting (late) 2021 Harvest for Seed 2021 Planting (~640 Ha)	<b>1,042.4</b>
<b>Total Farmable Land</b>	<b>1,815.4</b>

BSA’s Cayo One Estate farm in 2019; it is ~8 miles east of Belmopan near the village of Cotton Tree in the Cayo District.

**Weather Summary:** 2019 is likely to be the driest year in Belize since record keeping began over fifty years ago (as well as in much of Central America). Rainfall in Belize’s Cayo district is 34% of normal in the year through September 30<sup>th</sup>, 2019 with a YTD deficit of 918 mm. Most of this deficit has occurred in the Jun-Sep period, with very little rain during what is usually Belize’s wettest season. We are also now entering the peak of the active cyclone period, which stretches from late August through mid-November. No significant cyclone activity is currently threatening Belize or the western Caribbean.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>2019</b>	82	42	21	54	67	77	56	8	66	91			473
<b>2000-2018</b>	143	69	53	41	113	265	251	233	223	290	224	127	2,032
<b>2019 Deficit</b>	<b>61</b>	<b>27</b>	<b>32</b>	<b>-13</b>	<b>46</b>	<b>188</b>	<b>195</b>	<b>225</b>	<b>157</b>				<b>918</b>

You can follow Belize’s weather on: <http://www.hydromet.gov.bz/observations/radar/radar-images>

We also use the US NOAA Hurricane Center weather radar network which monitors the Caribbean basin, and recommend:

<http://www.nhc.noaa.gov/>

<https://www.wunderground.com/forecast/bz/belmopan>

# **Belize Sustainable Agriculture, Ltd. Farming Report – October 21<sup>st</sup>, 2019**

## **BSA Strategic Shift to Sugarcane Production**

This is the first quarterly report under BSA's new strategy, beginning with the 2019/20 season, to shift to 100% sugarcane production under a new 7-year offtake agreement with Santander Sugar, Ltd. ("Santander"). Our experience during the 2015-2017 crop years confirmed that, while corn and bean farming has the potential to generate substantial profits, the combination of the high capital investment requirement to farm and process them, corn & beans' greater exposure to pests and disease, their greater sensitivity to excess/insufficient rainfall, the challenges of exporting to Guatemala/Central America while maintaining high standards of integrity, and the vicissitudes of working with a Fortune 100 company such as PepsiCo/Frito-Lay, together made a compelling case for a conversion to sugarcane production sold to a local mill.

Santander had regularly approached BSA since 2016 to consider a shift to sugarcane production. The above factors, combined with Santander's willingness to enter into an attractively priced long-term (through July 2026) offtake agreement, BSA's location almost adjacent to Santander's mill (~3.5 miles across the new Belize River bridge about to be built), sugarcane's greater resilience to climatic and pest/disease issues, and Cayo One's soil type's excellent suitability for sugarcane production, all made a compelling case BSA to shift its focus to sugarcane.

Sugarcane is a semi-permanent annual crop with a very different growing cycle from corn and edible beans, so going forward the Farming Report will be published quarterly at the beginning of February, May, August, and November. Our next report will therefore be published in early February 2020.

For this first report we will initially provide an overview of key factors relevant to sugarcane production, which will make for a longer than typical report. The factors are excerpted from a more detailed Offering Memorandum CSA's investors will shortly receive. The Farming Report will then discuss in a more focused fashion this season's progress in planting sugarcane.

### **Sugarcane Overview**

#### **History**

Sugarcane (*Saccharum officinarum*) is indigenous to tropical parts of South and Southeast Asia. The earliest known production of crystalline sugar began in northern India and although the exact date of the first cane sugar production is not known, it is widely accepted that Indians had mastered how to crystallize sugar during the Gupta dynasty, around 350 AD.

There are records of knowledge of sugar among the ancient Greeks and Romans, but only as an imported medicine, and not as a food. Around the 8th century, Muslim and Arab traders introduced sugar from South Asia to the other parts of the Abbasid Caliphate in the Mediterranean, Mesopotamia, Egypt, North Africa, and Andalusia. It was among the early crops brought to the Americas by the Spanish, from their fields in the Canary Islands, and the Portuguese from their fields in the Madeira Islands.

In the 16th and 17th centuries, contemporaries often compared the worth of sugar with valuable commodities including musk, pearls, and spices. Sugar prices declined slowly as its production became multi-sourced, especially through British colonial policy. Formerly an indulgence of only the rich, the consumption of sugar also became increasingly common among the poor as well.

During the 18th century, sugar became enormously popular. Britain, for example, consumed five times as much sugar in 1770 as in 1710. By 1750 sugar surpassed grain as "the most valuable commodity in European trade — it made up a fifth of all European imports and in the last decades of the century four-fifths of the sugar came from the British and French colonies in the West Indies."

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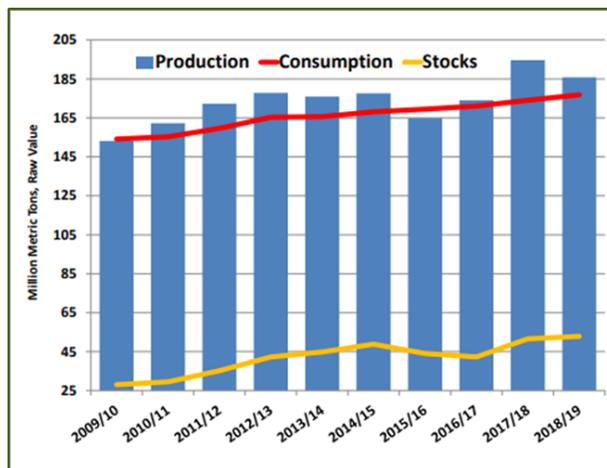
By the turn of the 20th century, sugar was such an important part of western economies that the American Sugar Refining Company was one of the original 13 constituents of the Dow Jones Industrial Average in 1896 and Tate & Lyle Ltd was one of the original 30 constituents of the FTSE-30 Index in 1935.

The Silesian sugar beet was then introduced to France, where Napoleon opened schools in response to British blockades of cane sugar during the Napoleonic Wars, and which ultimately stimulated the rapid growth of a European sugar beet industry. In 1840 only about 5% of the world's sugar was derived from sugar beets, but by 1880 this number had risen more than tenfold to over 50% as sugar beets were introduced to Germany, Russia, and North America. Today, beet sugar has declined to slightly more than 20% of world sugar production.

### The Global Market for Sugar and sugarcane

Global demand for sugar is forecast by the USDA at about 178 million MT in the 2018/19 harvest year and has grown at a modest 1.7% annual rate over the past decade, which has recently decelerated to 1.5% from a 2% growth rate at the beginning of the decade.

Looking forward, the UN FAO forecasts that global sugar demand will continue to grow at about 1.5% annually over the next decade, with developed countries growing at a reduced annual rate of 0.3% and developing countries continuing to grow at a more rapid, but modestly declining 1.9% annual rate.



**While demand for sugar for human consumption is forecast to grow modestly, growth in demand for sugarcane, as opposed to sugar, is expected to be much higher thanks notably to increasing demand for ethanol. As sugarcane is the primary feedstock for almost 80% of the world's sugar in 2018/19, this is an important data point.**

As an example, Brazil's EPE Agency recently forecast 2030 demand for Ethanol as a result of RenovaBio. Using a medium growth scenario (more conservative than the Government's), 2030 fuel ethanol demand would rise to 45 billion liters from 27 billion liters in 2018, a compound growth rate of 4.4%. Even assuming above trend growth in sugarcane farming yields, ethanol production would require 700 – 750 million MT of sugarcane by 2030, which compares with TOTAL 2018 Brazilian sugarcane production of ~630 million MT.

**CONCLUSION:** Global demand for sugar is expected to grow modestly over the next decade, but global demand for sugarcane should grow significantly faster assuming demand for biofuels continues its strong growth trend.

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**The 10 Largest sugarcane producers (2018/19 Estimates - USDA)**

- 1) Brazil: 628,000,000 MT
- 2) India: 415,000,000 MT
- 3) Thailand: 127,000,000 MT
- 4) China: 83,000,000 MT
- 5) Pakistan: 72,000,000 MT
- 6) Mexico: 54,000,000 MT
- 7) Colombia: 46,000,000 MT
- 8) Australia: 34,000,000 MT
- 9) Indonesia: 28,000,000 MT
- 10) Guatemala: 28,000,000 MT

Brazil dominates the field, and most major Brazilian cane processors have facilities that can easily redirect cane production to ethanol. Equally important, a significant portion (>75%) of Brazil's 35 million light vehicle fleet has "flex fuel" capability, which means that these vehicles can run indifferently on E27 blended gasoline or E100 pure ethanol. So, when market conditions are favorable Brazil changes its crush ratio between sugar and ethanol in response to price fluctuations. Brazil is also the low-cost producer of sugar cane, which gives it a unique competitive position and consolidates its position as the dominant market force in world sugar.

**The key to prosperity in the volatile sugar world is to be among the Low-Cost Producers.**

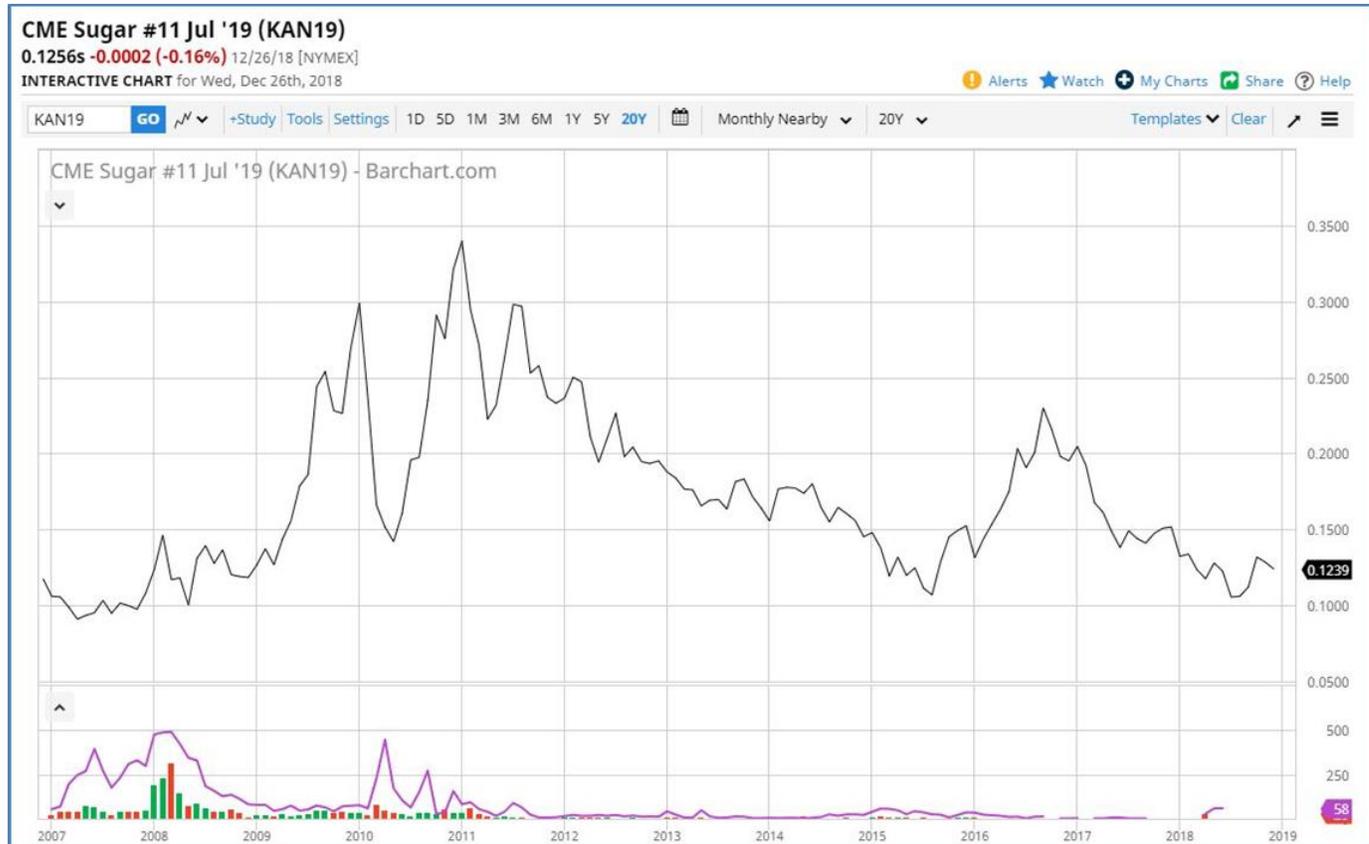
CSA expects its break-even sugar price to begin at ~\$0.10/lb. and to trend down towards the \$0.07/lb. level as the Cayo One Estate is fully developed. This will be achieved through a combination of entirely mechanized farming on large parcels of relatively flat land and above average yields through scientific farming. These production cost levels will be equal to or below those of most Brazilian producers.

**10 Year Historical price charts**

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The main sugar trading contract used as a reference by the sugar industry is:

- **CME (New York) Number 11 Contract – Raw Sugar**



- The ten-year data show an average price around \$0.20/lb.; over 75% of the time the price has been above \$0.15/lb., which is above the assumption used in the CSA base case.
- The sharp 2016/2017 price spike was the result of overly wet conditions in Brazil and drought in India, Thailand and China. It didn't take much of an imbalance to "spike the price" of sugar for two years...
- The 2017/2018 price decline was driven by better harvests and ESPECIALLY the elimination of EU sugar beet quotas, leading to a large increase in plantings (now being at least partially reversed due to an expected sharp drop in sugar beet prices).

## Sugarcane farming

Sugarcane has been grown for several millennia, today represents over \$50 billion in annual product sales, and plays an important role in the economy of many countries in the tropical and sub-tropical zones. Accordingly, sugarcane's cultivation has been carefully studied and continuing improvements in where and how it is planted, cultivated, harvested, and processed have allowed sugar to evolve from a luxury product for the very rich to a low-cost food source available to all.

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## Climate and Soil Requirements

Sugarcane cultivation requires a tropical or subtropical climate, with a minimum of 1,000 mm (40 in) of annual moisture, although the plant only thrives (in rain fed cultivation) where annual precipitation rates exceed 1,500mm (60 inches). It is one of the most efficient photo synthesizers in the plant kingdom. It is a C4 plant, able to convert up to 1% of incident solar energy into biomass. In prime growing countries/regions, notably: Australia, Brazil, Colombia, Cuba, Dominican Republic, Eswinti, Guatemala, Guyana, India, Indonesia, Jamaica, Pakistan, Philippines, and Thailand, sugarcane crops can often yield 100MT/Ha and can even reach commercial yields of 150MT/Ha.

Sugarcane is cultivated in the tropics and subtropics in areas with a plentiful supply of water for a continuous period of more than six to seven months each year, either from natural rainfall or through irrigation. The crop does not tolerate severe frosts. Therefore, most of the world's sugarcane is grown between 22°N and 22°S.

Sugarcane can grow on a range of soil types from sandy to clay soils but grows best on fertile, well-drained soils with an ideal pH of 6.5 (Cayo One happens to average 6.5 pH), however it can tolerate a degree of acidity or alkalinity and is moderately sensitive to soil salinity. Sugarcane can be grown on many soils ranging from highly fertile well-drained mollisols, through heavy cracking vertisols, infertile acid oxisols, peaty histosols, to rocky andisols. Both plentiful sunshine and water supplies increase cane production.

## Planting / Harvest Cycle

Although some sugarcanes produce seeds, modern stem cutting has become the most common reproduction method. Each cutting must contain at least one bud, and the cuttings are sometimes hand-planted. In more technologically advanced countries like Australia, Brazil, and the United States, billet planting is common. Billets (stalks or stalk sections) harvested by a mechanical harvester are planted by a machine that opens and recloses the ground. Once planted, a stand can be harvested several times; after each harvest, the cane sends up new stalks, called ratoons. Successive harvests give decreasing yields, eventually justifying replanting. Two to ten harvests are usually made depending on the type of culture, with many of the more productive countries that implement scientific farming methods replanting at least every five years. In a country with entirely mechanical agriculture looking for a high production of large fields, like in North America, sugar canes are replanted after three to four harvests to avoid a lowering in yields. In countries with a more traditional type of agriculture with smaller fields on hillier terrain and hand harvesting, like in the French island la Réunion, sugarcane is often harvested up to ten years before replanting.



The crop cycle varies between 10 and 24 months. In modern, fully mechanized cultivation areas, where temperature and precipitation rates are optimal, and cultivation, plant nutrition, and pest management are more scientific, the growing period is often considerably shorter, with plant cane harvested 9 months after spring emergence, and 7-8 months for ratoon crops. **This is the expectation for the sugarcane cycle at Cayo One.**

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## Weed, Pest, and Disease Management

Weeds can cause a number of problems for a sugarcane crop: competing for nutrients, sunlight and moisture; making harvesting difficult and reducing cane quality due to contamination; and some weeds can release compounds that are toxic to sugarcane growth. Examples of weeds found in cane fields are:

- Grasses – generally prolific, germinate in the early stages of a cane crop and compete vigorously with the crop
- Sedges – generally occur in wetter areas, the main sedge is nutgrass which is difficult and expensive to control
- Broadleaf weeds – generally regional and soil specific
- Vines – climb up and entangle themselves in the sugarcane, tend to germinate later in the season, can be difficult to control and manage, can impede harvesting and contaminate product leading to a lower price for the farmer

Methods used to control weeds in sugarcane crops are mechanical cultivation, herbicides, and the retention of post-harvest residues. A combination of these methods is typically used in an integrated management system. A challenge for the sugar industry and for growers is ensuring that there are no environmental impacts off-farm from the chemicals used. Herbicides must be applied by trained staff and the appropriate safety procedures followed.



*Hooded Sprayer applies herbicide carefully!*



*Cultivation also improves weed management*

The cane beetle (also known as cane grub) can substantially reduce crop yield by eating roots; it can be controlled with imidacloprid (Confidor) or chlorpyrifos (Lorsban). Other important pests are the larvae of some butterfly/moth species, including the turnip moth, the sugarcane borer (*Diatraea saccharalis*), the African sugarcane borer (*Eldana saccharina*), the Mexican rice borer (*Eoreuma loftini*), the African armyworm (*Spodoptera exempta*), leaf-cutting ants, termites, spittlebugs (especially *Mahanarva fimbriolata* and *Deois flavopicta*), and the beetle *Migdolus fryanus*. The planthopper insect *Eumetopina flavipes* acts as a virus vector, which causes the sugarcane disease ramu stunt. The best control methods for these pests include aerial insecticide spraying, reducing available food, and cultivation.

## Harvesting / Transport

Sugarcane is harvested by hand and mechanically. Hand harvesting accounts for more than half of global production and is dominant in the developing world. In hand harvesting, the field is first set on fire. The fire burns dry leaves, and chases away or kills any lurking venomous snakes, without harming the stalks and roots. Harvesters then cut the cane just above ground-

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level using cane knives or machetes. Various studies estimate that a skilled harvester can cut up to one half MT (500 kg/1,100 lbs.) of sugarcane per hour.

Mechanical harvesting uses a combine, or sugarcane harvester. The Austoft 7000 series was the first modern harvester design, but versions are now produced by other leading agricultural companies, including Cameco and John Deere. The machine cuts the cane at the base of the stalk, strips the leaves, chops the cane into consistent lengths and deposits it into a transporter following alongside. The harvester then blows the trash back onto the field. Such machines can harvest over 50 MT per hour; however, harvested cane must be rapidly processed. Once cut into billets, sugarcane begins to lose its sugar content, and damage to the cane during mechanical harvesting accelerates this decline. This decline is offset because a modern chopper harvester can complete the harvest faster and more efficiently than hand cutting and loading. Mechanized farmers use a series of hydraulic high-lift infield transporters to work alongside their harvesters to allow even more rapid transfer of cane to waiting carts for rapid transfer to processing mills. This mechanical harvesting doesn't require the field to be set on fire; the remains left in the field by the machine consist of the top of the sugar cane and the dead leaves, which act as mulch for the next round of planting.



*Mechanized Harvester feeding cane into 10+ MT trailer/tender*



*Road Hauling 30+ MT Cane Carts*

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### 2019 Weather Analysis

Belize's 2019 Wet Season, which usually runs from June through November, is on track to be the driest on record, at least as far back to the early 1960s (prior to then records have been harder to access). This was particularly so during the key months of June through September, when total rainfall at Cayo One / Belmopan was 207mm versus a 20-year average of 972mm, which represents only 21% of normal rainfall.

These severe drought conditions, which were felt through many parts of Central America but most intensively in Belize, led to many Wet Season crops, notably corn and soybeans, being devastated in the North and Central parts of Belize. Non-irrigated land, which represents almost 95% of Belize's farmland, will see losses of 75% to 100% of the country's corn and soybean crops. Sugarcane, as discussed below, has been less severely affected, although Corozal and Orange Walk Districts in the northern part of Belize have suffered more than Cayo district in the central part of the country.

October has, thankfully, gotten off to a much better start, with rainfall through October 15<sup>th</sup> totaling 115mm, which is back to 75% of normal relative to the 20-year average. It will bring much need moisture to BSA's sugarcane, which, again thankfully, is still healthy and only showing minor signs of heat stress. Temperatures have been consistent with seasonal norms, averaging (31.5° C / 89°F) and relative humidity at about 89% has been average.

We are now in the second half of a moderately below average Tropical Cyclone season, although there has been no activity over or near Belize. There is no cyclone activity in the western Caribbean forecast for the next fortnight, so once we are into November, the statistical probability of cyclone activity in Belize begins to diminish materially. Nonetheless, a late season tropical storm or hurricane remains a definite possibility.

### Land Preparation

Sugarcane farming is different from corn and bean farming in a number of respects, one of the most significant of which is that sugarcane is a semi-permanent crop, where once the cane is planted it will be harvested for four to eight years prior to needing replanting. This is very different from corn and beans where there are two crops a year, each crop requiring extensive cultivation and preparation prior to planting.

Field layout is also important to optimize harvesting speed and cost. A typical cane field will ideally be a parallelogram approximately 500 meters by 500 meters (250,000 m<sup>2</sup> = 25 Ha), which allows modern combine harvesters to work at peak efficiency. Accordingly, a field plan, as seen on the diagram on the first page of this report, has been prepared which divides BSA's usable farmland into 74 fields averaging 24.5 Ha.

It is important to ensure that sugarcane is planted on well drained land where there are limited possibilities for water to stagnate. While sugarcane is more resilient than corn (and much more than beans) to periods of heavy rains, the plants do not thrive during periods where their root systems are under water for many days.

BSA had originally expected to secure new funding from a regional agricultural fund in Q1 2019, however this funding was only secured in late Q3 2019. Accordingly, land development and preparation during the 2019 Dry Season was achieved with limited internal resources, along with much appreciated support from Santander Sugar. Notwithstanding these limitations, a considerable amount was achieved.

For BSA's **~210 Ha of already planted farmland** the principal land preparation was grass removal, plowing and tillage, and then levelling. The latter was achieved using GPS and laser-controlled equipment, so that water drainage was optimized, and the risk of ponding was substantially eliminated.

*(See pictures below for land preparation activities)*

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BSA had an additional **~190 Ha of mostly developed land** that required limited additional work, again mostly plowing, tillage, and levelling, to be brought into production. About 160 Ha of this land was improved and planted in the 2019 season, with the balance of ~30 Ha ready to plant in October if weather conditions allow.

A further **160 Ha of improved land** was at the point that it should take no more than 4-6 weeks of work in Q1 2020 to be ready to plant this land in Q2 2020 so that it yields a full commercial crop in Q1 2021.

Lastly, there was an additional **~215Ha of land was cleared/re-cleared** and is ready for improvement early in Q1 2020, so that it is ready for planting in Q2 2020.

BSA's goal is to grow the **current ~400 Ha** of planted sugarcane to **1,000-1,200 Ha by end Q3 2020**, with the final 600-800 Ha to be cleared in 2020 so that the land can be developed and planted in Q2 2021.

### Seed Selection and Planting

Sugarcane seed, as discussed above, is generally comprised of cut cane billets. Different cane varieties have been developed that are adapted to the specific microclimates and soil characteristics of particular growing regions.

BSA has so far used two varieties of cane seed provided by Santander Sugar, the most prevalent being the B79474, with some CP722087. BSA is going to experiment with an alternate supplier from Northern Belize for B79474 as well as two other varieties.

Cane which is planted mechanically is typically planted in furrows that are 180cm on center and 30cm in width. Planting density is typically 20 Mt / Ha, which should generate a population of 55,000 "Buds" (aka "Plants") / Ha. Each plant should deliver multiple harvestable sugarcane stalks. When these hypothetical numbers are achieved, yields can climb to 150+ Mt/Ha, which is actually achieved on only a small number of the best managed sugarcane estates. Much of the world averages 75-90 Mt / Ha, mostly due to inadequate planting and insufficient nutrition.

Plant Density is obviously one of the key factors which will affect sugarcane yields, followed by stalk girth and sucrose concentration. BSA believes that there are a number of opportunities to improve plant density and growth characteristics through enhanced planting techniques, which it intends to use beginning with the 2020 planting season. These will be discussed in the February Farming Report.

### Plant Nutrition

A dense combination of large plants such as sugarcane will naturally require substantial nutrients to develop their maximum potential. The nutrients include macro-nutrients such as Nitrogen (N), Phosphorus (P), Potash (K), and Sulfur (S) as well as a broad spectrum of micro-nutrients including Boron (B), Copper (Cu), Iron (Fe), Manganese (Mn), and Zinc (Zn).

BSA considers that an optimum nutrition program involves ensuring that the requisite amount of properly balanced base fertilizer is correctly applied at original planting, followed by supplemental applications of foliar fertilizer, both ground sprayed and aerially applied, and a diligent policy of processing post-harvest leaf waste into usable compost. Subsequent crops will follow a similar process, although less base fertilizer will be necessary after each harvest. BSA's nutrition program will be discussed in the February Farming Report.

### Weed and Pest Management

Grasses are the primary weed affecting sugarcane and BSA has developed a complete plan for their management. During the 2019 planting season, BSA was not able to properly implement its weed management plan due to insufficient funding. Since

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the first phase of funding was made available in September 2019, BSA has used an aggressive program of labor intensive cutting and manual spraying of grasses to address grass issues. BSA considers that excess grasses will have been removed by end Q4 2019 and looks forward to implementing its weed management program for both new plantings and existing plantings in 2020.

As discussed earlier, sugarcane is much hardier from a pest/disease viewpoint than previously farmed crops such as corn and beans. Nonetheless, there can be pests which appear and must be promptly eradicated. In late Q3 2019 BSA detected aphids appearing throughout much of its sugarcane and, thanks to the availability of funding, a rapid program of aerial spraying was implemented which promptly eradicated the infestation before it could do any material damage. BSA's management has extensive experience in pest and disease management, notably through pro-active aerial spraying programs, and believes that it is well positioned to manage future challenges.

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**Easterly View: – Apr 1, 2019**  
*125 Acres planted in Sep/Oct 2018 at 180 days  
BSA's initial trial planting provides many important lessons*



**Southerly View: – Apr 1, 2019**  
*Northern Section of Cayo One is still bush  
Major Goal for 2020 Dry Season is to finish clearing this section*



**Field 121 Land Preparation: – Mar 20<sup>th</sup>, 2019**  
*First Steps in 2019: Disk weeds and residue stubble  
Previously farmed land is the easiest to prepare for planting*



**Field 121 Land Preparation: – Mar 28<sup>th</sup>, 2019**  
*Ridging field prior to planting  
Last field to use raised beds before switch to level furrows*



**Field 121: – Sep 2<sup>nd</sup>, 2019**  
*Planted May 5<sup>th</sup> 2019 - Stand at 120 days (first 2019 planting)  
Good stand with some skips: Solid base from which to improve*



**Between Fields 121 and 112: – Sep 2<sup>nd</sup>, 2019**  
*Temporary Road allowing East – West passage  
Next step is to convert to All-Weather gravel road*

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**Fields 114/115: – June 1<sup>st</sup>, 2019**  
*First fields in eastern portion of property ready for conversion*



**Fields 114/115: – June 9<sup>th</sup>, 2019**  
*Tractor pulling Rome Plow*  
*Unusually dry conditions allow land work to continue*



**Fields 114/115: – June 26<sup>th</sup>, 2019**  
*Hillbank Agricultural comes to help with GPS guided leveling*  
*Leveling will optimize drainage – good for yields and crop health*



**Fields 114/115: – July 28<sup>th</sup>, 2019**  
*We can now use level furrows thanks to Good Drainage*  
*Eliminating raised beds means stronger & healthier root systems*



**Field 214 Harvesting for Seed: – August 7<sup>th</sup>, 2019**  
*Cane planted in 2018 now provides seed for new BSA fields*  
*Fast turnaround from harvest to planting = much higher quality*



**Field 114 Planting: – August 7<sup>th</sup>, 2019**  
*High Density Single line Planting*  
*Fresh Seed planted at high density should increase yields*

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North Easterly View: – Aug 29, 2019  
*First phase of 2019 plantings*



Southerly View: – Aug 29, 2019  
*First Phase of 2019 plantings*



Field 214: – September 9<sup>th</sup>, 2019  
*2<sup>nd</sup> Crop begins to emerge*  
*2018 plantings were partly harvested as seed for 2019 plantings*



Fields 114/115: – October 9<sup>th</sup>, 2019  
*August plantings at 60 day mark*  
*Level furrows in well drained land look to deliver best potential*



Cayo One: – October 1<sup>st</sup>, 2019  
*Field Inspections detect Aphids emerging after first rains*  
*Rapid spraying required: Crop dusters in action by October 3<sup>rd</sup>*



Cane Harvesting the Old Fashioned Way is Hard Work!  
*BSA Managing Director Abram Dyck in Orange Walk District*  
*Helping to harvest cane for a Charity using a machete*

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## Market Conditions and Conclusion

### Global Raw Sugar Market (NY #11 Sugar Futures Contract)

The global benchmark for raw sugar, on which BSA’s payments for sugarcane from Santander Sugar are based, is the NY#11 raw sugar futures contract. The Chart below shows price activity over the past two years. **The 2-year average price is about 12.5¢/lb. within a 15¢/10¢ Hi/Lo range.**



Raw sugar’s 10 history tells a somewhat different picture, which sugar’s recent price at or near the bottom of its price range. **The 10-year average price is about 19.5¢/lb. within a 32¢/10¢ Hi/Lo range.**



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There are many factors involved in sugar's global Supply / Demand dynamics; these are discussed in detail in Caribbean Sustainable Agriculture's October 2019 Private Placement Memorandum, which is available upon request.

Some of the most important factors affecting the global sugar price include:

- Brazil's sugarcane production and the percentage of the sugarcane crop which is converted to ethanol. Brazil produces about 40% of the world's sugarcane and is among the lowest cost producers, with estimated total production costs in the 10¢ to 11¢ / lb. range. Brazil is the world's second largest ethanol producer and consumer (behind the USA) and the dynamics between crude oil prices and sugar prices can significantly impact Brazil's exportable sugar surpluses. In 2019/20 Brazil is expected to convert about 65% of its sugarcane production to ethanol. Brazil is truly the "800 lb. Gorilla" of the global sugar market and plays a pivotal role in establishing the equilibrium price for sugar.
- India's sugarcane subsidy policies and the amount of raw sugar expected to be "dumped" on world markets. India is the world's 2<sup>nd</sup> largest producer, generating over 20% of the world's sugarcane. However, most of this is produced on small farms and the Indian government sets, as part of its social policies to support the many millions of politically important small farmers, a very high "Fair and Remunerative Price" which sugar mills must pay to cane farmers, currently the equivalent of USD 38.75/Mt. India is therefore producing growing sugar surpluses; the Indian government then subsidizes domestic sugar mills to sell ("dump?") these surpluses on global markets. Moreover, unlike Brazil, India produces only modest amounts of ethanol, despite its need to import large quantities of petroleum, as it remains illegal to produce ethanol from crushed cane juice (only molasses can be used as an ethanol feedstock).
- EU sugar beet policies have recently had a noticeable impact on sugar prices. The EU's 2017 lifting of 50-year-old sugar beet production quotas, at a time when EU farmers enjoyed relatively high fixed price sugar beet supply contracts from local mills, led to a surge in sugar beet production. This in turn led to the EU moving from a modest net sugar importer sugar to having a significant exportable sugar surplus. The collapse in intra-EU sugar prices then led mills to sharply reduce the price paid to farmers, and the EU has returned to a balanced internal market that uses imports to create a modest exportable surplus. The EU sugar price is of special relevance to BSA because Belize exports virtually all of its output as raw sugar destined for refining in the EU (mostly in the UK); these exports are duty free which provides Belize (and other ACP countries) preferential access to the EU's sugar market, whose price (on an FOB equivalent basis) still trades at a modest (10%) premium to the global market price.

Going forward, BSA's quarterly Farming Reports will discuss key developments in the global sugar market and our internal expectations for the price BSA expects to receive for our sugarcane crop.

### Conclusion

*We are excited to be firmly underway on BSA's strategic repositioning into sugarcane production and look forward to reporting regularly on our progress.*

*We are also relieved that the 2019 Drought appears to be (finally!) receding. So far, the 2019 hurricane season is proving to be benevolent, although there remains risk for the next four to six weeks...*

*Since the previous Farming Report was published, we must share the sad news of the passing away from illness of BSA's General Manager John Peters. He has been succeeded by David Baugh, who joins our team from Arkansas, USA where his family has a long farming tradition.*

*Thanks! - Abram Dyck, David Baugh, and the Farming Report Editorial Team*

## Belize Sustainable Agriculture, Ltd. Farming Report – October 21<sup>st</sup>, 2019

BSA is currently evaluating the case for inclusion of Field Records and, if it is positive, the content and format of such records.