This is the **Second** quarterly Farming Report for BSA's 2019/2020 Farming season. Its main objectives are to provide information/data about BSA's sugarcane farming activities, climactic conditions, agricultural pests, and market conditions.



BSA's Cayo One Estate farm in 2020; it is ~8 miles east of Belmopan near the village of Cotton Tree in the Cayo District.

**Weather Summary:** 2019 was the driest year in Belize since record keeping began over fifty years ago. Despite a marked improvement in Q4 2019, 2019 Rainfall in Belize's Cayo district was only 46% of normal, with a deficit of 1,092 mm. Happily, there was no significant 2019 cyclone activity in Belize. 2020 rainfall has gotten off to an encouraging start, especially following an improved Q4 2019. Long ranger forecasts are warning of a drier than average Summer 2020.

Cayo One - Belmopan Precipitation Data (mm per month)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2020	181	46											227
surplus/deficit	41	(22)											19
20 Year Average	140	68	51	42	111	256	241	222	215	286	219	128	1979
2019	82	42	21	54	67	77	56	8	55	210	120	148	940
surplus/deficit	(61)	(27)	(32)	13	(46)	(188)	(195)	(225)	(168)	(80)	(104)	21	(1092)
20 Year Average	143	69	53	41	113	265	251	233	223	290	224	127	2032

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:

 <a href="http://www.nhc.noaa.gov/">http://www.nhc.noaa.gov/</a>

 <a href="http://www.nhc.noaa.gov/">http://www.nhc.noaa.gov/</a>

#### **Summary Conclusions**

The November 2019 through February 2020 period has provided both sufficient rainfall and reasonable temperatures for BSA's 2019 sugarcane planting to develop well. We are especially encouraged by the early development of the fields which were planted entirely under the supervision of BSA's team (see Fields 114/115/123/124 photos & captions below).

BSA is poised to resume land development operations during the second half of March, after which the next phase of sugarcane planting will begin, likely in the second half of April. The recent confirmation of a first substantial irrigation well on the western side of Cayo One is will allow planting to begin earlier and continue until the seasonal rains begin. Going forward, this source of water could positively impact future yields in a meaningful way.

BSA's goal was to complete all land clearing operations this season (March through June), and sufficient land development to have at least 400 Ha planted in sugar cane, with an upside goal of 800 Ha ready to plant. We are reducing our 2020 base and upside goals principally due to delays in securing additional funding, and await to determine any COVID-19 issues.

We continue to strengthen our working relationship with Santander Sugar in all aspects of our activity, from planting, nutrition, and pest management techniques to new sugarcane varieties and possibly to new European outlets for their sugar. We value a client and partner who is so committed to the success of its key suppliers. We were pleased to learn that 2020 is the year where Santander, after years of large investments, will begin to generate substantial positive EBITDA thanks to greater sugarcane supply, higher yields, higher quality, and improved prices, notably in the EU/UK.

CSA has recently launched a fully updated website (link: <u>Home | Caribbean Sustainable Agriculture, Ltd</u>) which readers are encouraged to consult; we very much welcome your feedback!

This report was due to be circulated in early March, using end February data. The extraordinary circumstances created by COVID-19 caused us to delay publication by a fortnight, so that more market price activity could be gathered and analyzed.

## 2020 Land Development

2020 Land Development is broken into three phases broadly described below; more specific timing will be a function of closing various financing facilities on which the CSA group is currently working.

### 1) Land needing minor to partial additional development to be ready for 2020 planting

These are the White (30 Ha), Yellow (61 Ha), Orange (98 Ha) and Purple (217 Ha) areas in the map on the first page, totaling 406 Ha. These are all areas where trees were cleared several years ago, the land was (mostly) windrowed, and some plowing has already been done. The main focus will therefore be additional plowing, removal of debris, disking, and then levelling (this last is critical – see below).

Work will begin on certain Orange/Yellow sectors in mid-March; given the success with fields 114/115/123/124 we are anxious to develop other eastern fields (215/225/216/226) so that they are ready for planting as soon as irrigation can be brought to this area, hopefully by late April.

Later in March we plan on starting work on the White and certain Yellow areas so that we can coordinate fully planting fields 223/224/233/234 as the areas planted in 2019 are harvested.

Late April should see the northerly extension of the eastern fields (226/236) as well as the major push on the western section of Cayo One (fields 211/212/221/222/231/232/241/242). As this is also one of the wetter areas among our fields, the best time to work on this, including bringing in any necessary drainage, is during the driest period which is

typically late April through late May. Where possible we will also seek to "square out" fields with small amounts of clearing work so that they can be fully planted in one season (fields 243/244).

### 2) Land requiring full clearing to be ready for 2020 planting if weather and financial circumstances allow

These fields are a subset of the "Photo" areas in the map on the first page, totaling about 250 Ha, which run along the path of "V2 Road", one of our three main North / South Roads and the first one which we expect to fully complete from North to South). They include fields 312/313/322/323/342/343/352/353. Earlier soil tests carried out in 2012/2013 prior to acquiring the property showed excellent soils in this section of Cayo One, so it makes the most sense to next develop land that is both of excellent quality and adjacent to a main road.

A combination of early closing of financings, availability of third party contractors to supplement our own equipment, and another year of a drier than normal June will be necessary to successfully develop these fields in the 2020 season so that they can be "late planted" to provide seed for the 2021 planting season.

Our minimum objective for these fields is to use third party contractors to complete a double pass of bush clearing in this area so that it is ready for early windrowing and subsequent development in 2021.

#### 3) Land requiring initial tree clearing to be ready for 2021 development and planting

These fields are the remaining "Photo" areas in the map on the first page, totaling about 800 Ha, which mostly run along the eastern side of the property (field series 3X4/3X5/3X6) along with a smaller section which runs on the western side of the property (field series 3X0/3X1).

The sole goal for these fields is to complete a double pass of bush clearing using a third party contractor. We would expect the contractor to be able to clear 150–160 Ha/week so this would represent 5 to 6 weeks of continuous effort.

The ability to execute this double pass of bush clearing will greatly increase our ability to timely complete planting in 2021 as the bush will be able to partially decompose during the 2020 Wet Season, which makes subsequent windrowing, one of the most intensive and time consuming land development components, much faster and easier.

The main components of land development include the following steps, which are presented in the order they are typically executed. The May 2020 Report will include up to date photographs of these different land development operations.

# 1) Bush Clearing (Double Pass)



Chain being attached to Heavy CaterpillarD-9 Bulldozer First Heavy Bulldozer heads off into light bush to begin clearing

# 2) Windrowing

3)



Heavy Tractor pushing debris into "windrows" piles

Land Chaining



Windrow piles ready for burning



Heavy Bulldozers pulling chain through fields to extract stumps and debris



Side view of 150m long chain – each 60cm link weighs over 40 Kg

# 4) Debris Removal (Human & Mechanical)



BSA Team removing larger debris from cleared field



Mechanical rake quickly removes large amounts of smaller debris





Caterpillar D-6 Medium Bulldozer pulling Rome plow



Rome plow has heavy disks that break up field topsoil

# 6) Debris Removal (Human & Mechanical)

Repeat of activity described in 4) above; typically at a faster rate than the first pass

7) Chaining

Repeat of activity described in 3) above; the chain may be set to go deeper looking for any remaining stumps

8) Plowing

Repeat of activity described in 5) above

# 9) Debris Removal (Human & Mechanical)

Repeat of activity described in 4) above; final quick pass looking to remove any remaining debris

10) "Ripper" and "Refining" Disk Passes



Medium tractor pulling Refining Disk

11) Contour Leveling

Land ready for Contour Levelling



Heavy Tractor pulls GPS & Laser guided contour leveler



Contour leveling underway



Land is now ready for initial planting phases, which include base fertilizer application and furrow preparation.

The total budget for the above steps is approximately 1,400 / Ha, depending on the specifics of the land (e.g. limited large trees, moderate rock presence, reasonable drainage, etc.) One factor which helps to contain or reduce this budget is access to tax free fuel, which the Government of Belize has graciously provided to date in order to support the development of new agricultural areas. As fuel costs typically represent ~\$350 / Ha and taxes represent almost 50% of total fuel costs, access to such tax free fuel has a material impact on land development costs.

### 2020 Planting Program

BSA's 2020 Planting Program will benefit from the experience gained from the 2018 and 2019 planting programs, which we believe will put BSA on a firm track to generate top quartile (110+ MT/Ha) yields within two to three years

BSA's planting program is focused on achieving a standard where it's "Quality over Quantity" and where we "Do it right the First Time". Our principal objectives include:

- 1) Start the Planting Program with land that has been properly prepared, including using contour leveling to ensure optimum drainage and minimal "ponding"; this allows for good drainage using the Cayo Estate's gentle natural slopes.
- 2) Schedule and implement initial fertilization based on soil characteristics and yield goals
- 3) Use "low/non-ridged furrows" to ensure strong root development
- 4) Plant seed slowly and methodically, and have a team behind the planter to ensure that seed density and position are optimal
- 5) Careful "Furrow Covering" will provide optimum seed development conditions
- 6) Post planting irrigation is a MAJOR plus and will ensure optimum early stage plant development

# **Base Fertilizer Spreading (New Plantings)**





Medium Tractor with Fertilizer Spreader

Medium Tractor pulling fertilizer spreader

# **Furrow Preparation**



Fields 114/115/123/124 furrows require no ridging thanks to contour leveling and natural slope

# Planting



Mechanical 3 Row Planter – Key is to "Go Slow" and "Do it Right" 2020 Plan will include team following planter to ensure seed is correctly placed and spaced

# **Covering Furrows**



Covering Furrows ensures seed can grow in optimum conditions with no rot promoting air pockets

# **Targeted Result**

Execution of all key steps of Land Development and Planting will lead to superior plant density and optimum growing conditions. Combined with proper plant nutrition and pest/disease management, and reasonable climactic growing conditions, good top quartile yields (110 MT/Ha to 140 MT/Ha) can be achieved.



Aerial view of Fields 114/115/123/124 in late January 2020 (Back four fields: Note greater density and evenness)

Northern side of Field 123 175 days after planting (Note excellent Plant Density and Vigor)

#### 2020 Crop Nutrition & Pest Management

#### Nutrition

Crop nutrition is a fundamental part of any agricultural activity. We have been carrying out multiple trials of various types of granular fertilizer as well as liquid fertilizers in order to fine tune our sugarcane nutrition program going forward.

Generally speaking, an initial substantial application of granular base fertilizer, of the order of 500 Kg/Ha, needs to be made prior to planting. The specific details of this initial application are a function of soil characteristics and targeted yields. At planting time, certain liquid fertilizers may also be applied to provide additional micro-nutrients and other benefits. Subsequently, multiple applications of both granular and liquid fertilizers, with a substantial nitrogen component as well as additional Phosphorous where necessary, are scheduled. Lastly, in the 30-60 day period prior to harvesting, certain late stage fertilizers can be applied to hasten sugarcane ripening and to increase sucrose availability.

Once an original sugarcane planting has been harvested, a different nutrition program is implemented for subsequent harvests (aka Ratoon crops), while the types of fertilizers applied are broadly similar, amounts and characteristics will differ, again based on soil characteristics and yield objectives.

The May 2020 Farming Report will include a detailed discussion of BSA's initial programs for plant nutrition both at original planting and for subsequent Ratoon harvests.

#### Pest Management

Pest management for sugarcane has two key components: weeds/grasses and insects/diseases.

Weeds/Grasses are both a significant threat to sugarcane yet readily manageable through a balanced use of herbicides, mulching, and properly planted sugarcane. The most important period for weed/grass management is the window after harvesting when fields are exposed to sunlight, which allows weeds/grasses to grow rapidly.

Insects/Diseases are potential issues for sugarcane, although it is a hardy plant that, with regular inspections and prompt prophylactic action, can generally overcome most insect/disease issues.

The May 2020 Farming Report will include a detailed discussion of BSA's initial programs regarding Pest management.

#### 2020 Crop Status as of February 29th and Harvest Program

We are generally pleased with the status of all of our sugarcane fields, especially given the drought conditions Belize experienced during the summer of 2019. We do expect, however, a significant variation in initial yields between fields, principally due to planting methodologies and climatic conditions during specific growing cycles, absolute length of growing cycle prior to harvest, and field specific nutrition programs (Refer to table below).

Belize's favorable climate, in terms of both temperatures and precipitation, will typically allow sugarcane varieties that are well adapted to the region to mature in a range of 315 to 360 days. BSA's goal is to gradually adjust peak harvest windows so that harvesting can be carried out in the mid-February to early-May window, which will in turn allow time to properly prepare and fertilize the sugarcane roots that will produce the subsequent year's crop.

BSA's farming team gradually took operational control of sugarcane planting during the course of the 2019 season and was able, by August 2019, to begin directly applying some of our team's prior experience from sugarcane farming in the Orange Walk District as well as Cayo One specific insights gained during the 2018 and early 2019 planting periods.

BSA has used fields 114/115/123/124 as showcases for how it proposes to manage plantings going forward. There were some minor differences in planting techniques between 114/115 and 123/124 but the nutrition and pest management methodologies have been the same. As the photographs above evidence, the four showcase fields demonstrate both excellent stand density as well as vigorous and healthy plants.



Road between Fields 112and 121 at 280 days photograph taken in late February

Path between Fields 115 and 124 at 210 days Photograph taken in early March

#### The table below shows the expected timetable for harvesting BSA's 2020 sugarcane crop.

Several fields have been subdivided into multiple subsections to reflect various field specific differences, notably whether certain fields, originally planted as tests in 2018, were harvested for 2019 seed or planted during two different periods.

Planting and Harvest dates refer to a specific week, each month being divided into four weeks, and the month being expressed as a Roman numeral. For example 1/V/19 means a field was planted during the first week of May in 2019.

BSA's 2020 sugarcane harvest will be separated into two categories: sugarcane delivered to Santander Sugar for commercial processing and sugarcane used for seed.

Field #	Hectares Planted	Planting Date	Seed Type	Yield Goal (MT / Ha)	Harvest Date	Growth Cycle Days	Commercial MT	Seed MT
111	20.73	2/V/19	1	100	1/V/20	360	2,073	
112	24.28	2/V/19	1	90	1/V/20	360	2,185	
113	24.28	2/V/19	1	90	1/V/20	360	2,185	
114	23.1	1/VIII/19	1	105	4/V/20	300	2,426	
115	24.28	1/VIII/19	1	105	4/V/20	300	2,549	
121	28.32	2/V/19	1	95	4/IV/20	345	2,690	
122	21.44	1/V/19	1	90	4/IV/20	360	1,930	
123(s)	12.14	1/VIII/19	3	115	4/V/20	300	1,396	
123(n)	12.14	2/IX/19	3	120	4/V/20	255		1,457
124(s)	12.14	1/VIII/19	3	115	4/V/20	270	1,396	
124(n)	12.14	2/IX/19	3	120	4/V/20	255		1,457
212(a)	2.3	2/VIII/19	2	90	4/V/20	270		207
212(b)	8.2	2/VIII/19	2	65	4/V/20	270		533
213(a)	5.1	2/V/19	2	90	1/V/20	360		459
213(b)	19.9	2/V/19	2	65	1/V/20	360		1,294
214(a)	7.5	2/V/19	1	90	1/V/20	360		675
214(b)	7.5	2/V/19	1	65	1/V/20	360		488
214(n)	5.7	3/V/19	1	90	1/V/20	345	513	
214(e)	5.7	2/VIII/19	1	120	4/V/20	270		684
215	20	2/VIII/19	1	115	4/V/20	270		2,300
222	2.22	2/V/19	1	85	2/V/20	360	189	
223	14	2/V/19	1	85	2/V/20	360	1,190	
224	24	2/V/19	1	85	2/V/20	360	2,040	
232	2.2	3/V/19	1	85	2/V/20	360	187	
233	20.88	3/V/19	1	85	2/V/20	360	1,775	
234	26	3/V/19	1	85	2/V/20	360	2,210	
Total:	386.19						26,934	9,553

Certain fields will be harvested before their peak production stage, but these fields will all be used for planting seed. While tonnage obtained will be lower than a field's maximum potential, sugarcane which is before peak maturity typically produces more vigorous seed. BSA plans to use the  $\sim$ 6,000 MT harvested from fields 123/124/214/215 as the primary seed source for its new plantings in May/June 2020.

#### 2020 Sugar Market Conditions

This report now includes some end of February data, as well as other data through March 16<sup>th</sup>. During late 2019 and the first two months of 2020, raw sugar prices were recovering materially towards their 5 year average prices. This was due to the confluence of several factors where excess global production was abating:

- 1) The India Sugar Trade Association (ISMA) on Mar 3 reported that sugar production in India, the world's second-largest sugar producer, dropped sharply by -22% y/y to 19.489 MMT during Oct-Feb.
- 2) In Thailand, the world's fourth-biggest sugar producer, the Office of the Cane and Sugar Board on Mar 4 reported that Thailand's sugar production from Dec 1 through Mar 2 was down by -21.3% y/y at 8.1 MMT. The Thailand Meteorological Department said this year's drought in Thailand is the worst in 40 years and the Thai Sugar Millers Corp on Feb 7 forecasted that Thailand's 2019/20 sugar production would drop -35% y/y to 9 MMT from 14 MMT.
- 3) In Brazil, the world's largest sugar producer, Unica (the Brazilian Sugar Industry Association), confirmed that Brazil's 2019/20 Center-South sugar production Oct-through-Feb rose only +0.47% y/y to 26.487 MMT. The percentage of sugar cane crushed for sugar fell to 34.46% from 35.40% last year and the percentage of cane crushed for ethanol production rose to 65.54% from 64.60% last year.
- 4) The EU Agriculture and Rural Development Agency confirmed that EU internal sugar production surpluses were fully abated, and that the EU would need to increase raw sugar imports by 6% to maintain estimated end stocks of 1.51m MT (down 17% YoY) at the end of the 2019/2020 season.

Simply put, after several years of over production and historically very low prices, excess raw sugar supply has finally been receding. This was clearly evidenced by sugar's strong price recovery to the 15¢/lb. level. Moreover, anecdotal evidence from Santander Sugar indicated that European refiners have paid in excess of USD 400/MT (FOB Belize) for Tariff Free Belize sugar for delivery this season, which equates to 18-19¢/lb. This is a dramatic improvement over 2017/18 and 18/19.

### Sugar Price (ICE #11 Raw Sugar Futures) – 1 Year through February 29<sup>th</sup>, 2020



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However, by the last week of February both the price of crude oil and the Brazilian Real had begun precipitous declines, which in turn started to weigh on the US dollar sugar price.

### Then came the COVID-19 Pandemic, the Saudi-Russia oil dispute, and the subsequent market hysteria. These saw dramatic declines in the price of oil and the Brazilian Real, which placed additional heavy pressure on the USD sugar price, which in turn fell at its fastest rate since early 2010.

The first table below shows how, while the USD sugar price has fallen nearly 30% from its February 2020 peak through March 16<sup>th</sup>, 2020, during that period the BRL sugar price has fallen less than 20% and remains above levels seen through out 2018 and 2019.

The second table below shows that until the COVID-19 Panic, sugar and oil prices had been able to decouple, and sugar was able to respond more independently to its fundamental supply/demand criteria.

We believe that part of sugar's dramatic price decline has been the result of the unwinding of hedging strategies by major Brazilian producers where they were, in effect: "long sugar / short crude", the latter being a substitute for ethanol. Subsequently, it is likely that traders are keenly aware of the sugar / crude correlation and have been trading the underlying commodities accordingly.

Encouragingly, anecdotal reports indicate that the Tariff Free Belize Sugar price, while lower, has only dropped to the USD 350/MT level, a 15% decline versus late February, and much less than the 30% decline in the #11 Sugar Futures price

Going forward, it is currently difficult to predict where sugar prices will stabilize. Key factors will likely be the price of oil and the Brazilian Real. As the final charts show, these have been volatile over time but have typically corrected from periodic sharp downwards or upwards movements.



Sugar Price in US Dollars (USD) and Brazilian Reais (BRL)

USD Sugar price compared to USD Crude Oil price





# USD Oil Price (West Texas Intermediate)

USD / BRL Exchange Rate



## Conclusion

The first data points emerging from BSA's refocus on sugarcane are quite encouraging, which the forthcoming initial harvest should confirm. While the current deep uncertainty over the impact of COVID-19 poses many challenges, we believe that we are farming the right crop with the right partner.

Please feel free to contact us with any questions and check out <u>www.belizeag.com</u> for additional information.

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

BSA maintains individual field records for all of its planted fields; Field 124's record below is an example of how BSA tracks data for all of its fields.

FARM LO	LOCATION: Cayo One Estates					Field #	124	Total	23.87	(NI)	Location 1	Lati	tude	Long	itude
Coll Turno	Tuna Analua		c Doto		Analysi	a Dof #	Size (na)		(N)		1				
son type	pe Analys		S Date Organia		Analysi	S Kel. #	Useable		Location 2						
рп		CEU		Organic				512e (Ha)							
Silt		Clay		Sand							Location 4				
<u> </u>			Planting												
Variety 1 Variety 2 Mt / Ha							Harvest			Used For		Total Mt	Mt / Ha		
Start 1	6-Aug-19 End 1 6-Aug-19 Sc			South Half 12.14		20		Start 1		End 1		Se	ed		,
Start 2	18-Sep-19	End 2	18-Sep-19	North Half 12.14		20		Start 2		End 2					
		F	ERTILIZER	s				AGRI-CHEMICALS						RAIN	
Date	Date Analysis			Unit	Rate / Ha	Ground (G) Air (A)	Date	Analysis L			Unit	Rate / Ha	Ground (G) Air (A)	Month	ММ
13-May-19	8.82 - 22.	54 - 28.9 +	- 0.2S + 0.2	Kg	450	G	3-Oct-19	Malathion			L	1	А	May-19	66.55
3-Oct-19	Bio-Suelo			L	24.75	А	3-Oct-19	Stylet Oil			MI	404	А	Jun-19	77.47
	Applied to	North Ha	lf				22-Oct-19	Ametryne			L	1	А	Jul-19	55.88
30-Oct-19	9 46-0-0 Prosser on 13 HA		Kg	90	Α	22-Oct-19	Atrazine		Kg	1	А	Aug-19	7.62		
30-Oct-19	t-19 42-0-0-5 Amidas on 10 HA		Kg	79	А	22-Oct-19	Bind		MI	1	А	Sep-19	54.61		
22-Nov-19	2-Nov-19 Aporte Cobre		ML	400	А	11-Oct-19	Aporte Hexa 210 cc/ac		ML	518	А	Oct-19	210.00		
22-Nov-19	19 Aqua Veta		ML	12	А	11-Oct-19	Aqua Veta 30 cc/ac		ML	30	А	Nov-19	120.00		
22-Nov-19	19 DISPER Zinc			GR	90	А	11-Oct-19	Engeo 100 cc/ac 🛛 🔊			ML	100	А	Dec-19	148.00
22-Nov-19	-19 DISPER Cu Max		GR	26	А	11-Oct-19	Bind 660 cc/ac		ML	660	А	Jan-20	181.00		
22-Nov-19	9 Bind		CC	40	А	22-Nov-19	Karate		CC	80	А	Feb-20	46.00		
	Applied to North Half						Applied to North Half					Mar-20	0.00		
12-Dec-19	46-0-0 Prosser		Kg	55	А								Apr-20	0.00	
12-Dec-19	ec-19 18-46-0			Kg	55	А								May-20	0.00
														Jun-20	0.00
13-Dec-19	Dec-19 Pro-germinator 9-24-3			L	20	G								Jul-20	0.00
	Algas		L	1									Aug-20	0.00	
	9 rows on North side.												Sep-20	0.00	
13-Dec-19	c-19 Pro-germinator 9-24-3		L	20	G								Oct-20	0.00	
	Algas		L	1									Nov-20	0.00	
	8 rows along H2												Dec-20	0.00	
24-Dec-19	24-Dec-19 Cobrestable		L	1.23	А										
24-Dec-19	24-Dec-19 Spinning		MI	770	Α										
24-Dec-19 Ader		MI	40	Α											
24-Dec-19 Murilla		MI	321	Α											
24-Dec-19	I-Dec-19 Bind		MI	500	Α										
													Total	967.13	