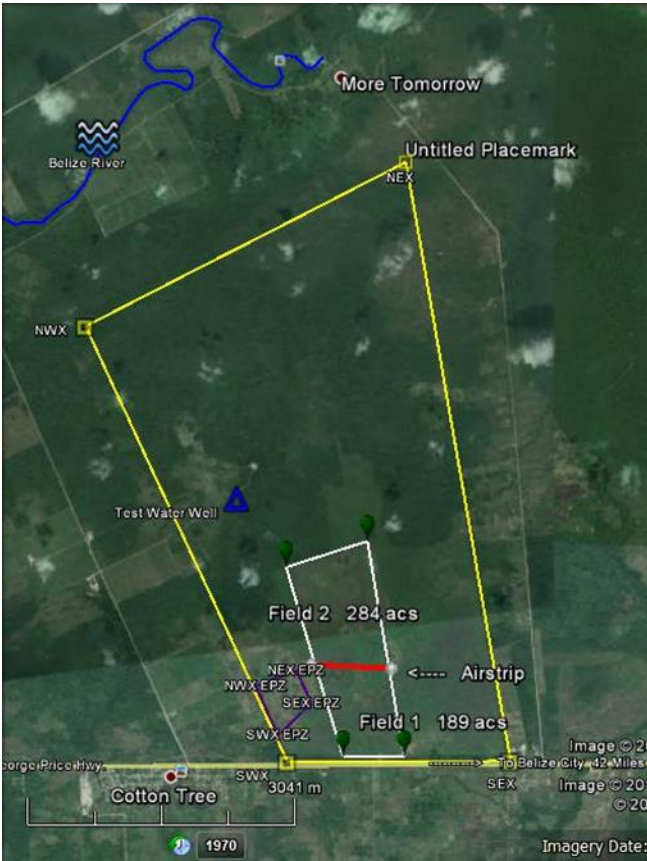


Belize Sustainable Agriculture, Ltd. Farming Report – June 14, 2016

General Comments & Weather



This is the fourth fortnightly Farming Report for BSA’s 2016 Summer (Wet) Season, whose main objectives are:

- Inform readers as to BSA’s farming activities by season, farm, and crop;
- Provide relevant data on climatic conditions and agricultural pests affecting BSA’s crops;
- Inform readers on domestic/regional market conditions for BSA’s crops.

BSA is only farming at the Cayo One Estate in the Summer 2016 season; it is situated approximately between miles 40 and 42 of the George Price Highway in Belize, near the village of Cotton Tree in Cayo District. Cayo One is some 41 miles west of Belize City, some 9 miles east of Belmopan and some 38 miles east of the Belize-Guatemala border at Melchor.

June 2016 has seen the return of seasonal rains right on schedule, with the first light thunder showers on June 3rd and some three and a half inches of rain falling in the first fortnight of June. This weather provided almost ideal (dare we say it?!) moisture to the soil for vigorous germination. If June sees a return to fairly average weather (a vast improvement on 2014 & 2015!) then conditions for the first part of the summer crop could be quite propitious. However, weather is undoubtedly the element over which we have the least control...

Belmopan Precipitation Data (mm per month) - June Data through June 13 th												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	105	282	30	66	71	86						
2000-2015	141	51	50	30	127	261	261	228	230	269	232	129

You can (normally) follow Belize’s weather on: <http://www.hydromet.gov.bz/250-km-radar-loop>

We continue to use the US NOAA Hurricane Center weather radar network which monitors the Caribbean basin, and would also suggest Weather Underground as an additional resource:

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

<http://www.wunderground.com/q/zmw:00000.2.WMGMM>

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Cayo One ~ 473 acres (100% non-irrigated)

Farm Operations

Land Preparations

These were timely completed, and a full description is provided in the Lot Records at the end of this document. We particularly expect to see a benefit from the Land/Planing/Levelling work carried out. The second land planing pass performed on Field 2 is already showing early benefits with a quasi-absence of puddling anywhere on the field (of course heavy rainfalls would likely trigger some ponding).

Seed Selection & Planting

BSA has chosen to plant most of its acreage in one seed variety, with the balance allocated to two trials (the third trial previously chosen was abandoned as the local seed dealer could not ensure timely delivery).

Planting began on Saturday May 28th and finished on June 1st. Final acreages planted were:

- **DeKalb 7088 - 425 acres (Part of Field 1 and all of Field 2) @ 27,000 seeds/acre**
- **Dow 3383 - 24 acres (Part of Field 1) @ 27,000 seeds/acre**
- **American Seed & Genetics R9000 - 24 acres (Part of Field 1) @ 27,000 seeds/acre**

All varieties displayed a vigorous emergence. See the May 17th report for a detailed description of these seed varieties.

We have been and will be fertilizing the three plots in exactly the same fashion for trial control purposes.

Fertilizer Program

We feel it is worth repeating BSA's fertilizer strategy for Cayo One, which is based on multiple goals:

1. Test the impact of higher fertilization rates on yields
2. Ensure that fertilization is at least 110% of theoretical "maintenance rates"
3. Test one plot for higher Nitrogen Applications
4. Initiate long term trial of organic worm based soil enrichment

For a detailed discussion of BSA's fertilizer strategy, see the May 31st report and the field matrices later in this report. However, based on experience at planting time this year and last, and being mindful of an expected sharp increase in acreage under production going forward, we intend to monitor this crop's performance to possibly re-evaluate our strategy regarding liquid fertilizers.

There has been debate for many years over the advantages/disadvantages of a liquid/dry fertilizer program at planting. Proponents of the "liquid" program claim the immediate availability of high levels of phosphorous and potassium is key to vigorous and healthy plant growth. This is countered by the "dry" fertilizer argument that the kernel has all the necessary nutrients and the immediate need for these high levels is simply non-existent that early in the plant's development cycle. They will typically place the trickle of dry granular fertilizer under the seed so the roots have ready and available access as soon as they need it. Both methods have found success and observed data indicate that there is really no clear "winner" when it comes to yields.

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Another thought is emerging: simply ensure that all of the necessary initial nutrients are available through the pre-plant fertilization program. This would require very little extra effort in soil preparation and eliminate a plethora of time consuming processes during planting. Arguments can be made for all three types of fertilizer application methods.

This last one is particularly appealing to the farm team as much time is spent in preparation of these liquids and their relative high cost/nutritional benefit is un-compelling. We will observe crop behavior this year, but expect that BSA will do comparison trials of these methods during the 2017 summer crop.

Early Crop behavior

The corn emerged promptly after the two rains that we had a few days after planting. The vigor looks good; spacing and singulation are very acceptable. In the next Farm Report we will present the actual plant counts for each variety and also give an opinion on how each variety is faring from an early entomological point of view.

We had hoped to receive a little grace from our biggest pest; the worm. However, through careful vigilance we were able to detect their presence in the perimeter of both Fields 1 and 2. BSA undertook a spraying of insecticide on June 13 around the perimeter of the fields to stop their advance further into the field. This is a common practice and is usually found to be very effective. The larvae hatch in the surrounding areas where machinery has left them untouched and when hatched, will come for their preferred meal; our corn. Early detection is a key to success as their mortality rate when young is much higher than slightly matured instars.

The insecticide used was Certero. It is a relatively new chemical from Bayer and was by far and away the best performer last year. We are hopeful of equally superior results this year. It was applied aurally as a ground rig was unavailable until later this week, and time is of the essence for these applications.



Field 1 Emergence Day 7 – June 8, 2016



Field 2 Emergence Day 8 – June 9, 2016

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Healthy Corn Sprout on Day 8 – June 9, 2016



DK 7088 Vigorous Sprout on Day 9 – June 10, 2016



Field 1 on Day 9 – June 10, 2016

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Market Conditions and Conclusion

Grain prices remain broadly unchanged in Belize during the past month, notwithstanding the recent improvement in global prices. They have in fact remained mostly stable over the five months since the end of the 2015 harvest, once again with the exception of weaker soybean prices which appear to have found a bottom.

Corn

Corn volumes in storage continue to be seen as adequate to meet needs until the summer 2016 corn crop is harvested. Belize's corn price of BZD 28.00-30.00/cwt (USD 310-330/mt) remains high compared to CBOT/World market prices, although once again it is important to remember that total demand at these price levels is limited.

Based on anecdotal evidence and aerial observations, we believe that corn plantings in Belize will be lower this season as farmers are beginning to diverting acreage to sugar cane (Cayo District) and Soybeans (Orange Walk District).

Meanwhile, the Spanish Lookout co-operative has reportedly been offering corn at the low end of the local price range but the quantities offered have not been sufficient to materially impact the market.

Soybeans

Soybeans in Belize remain firmed modestly in price, despite expectations for increased plantings. #1 Grade Soybeans are now selling at 50.00/cwt (USD 550/mt), although lower grade #2 are steeply discounted at \$40.00/cwt. (USD 440/mt).

The main challenge in soybean processing in Belize remains finding a market for residual soybean oil, although we understand that local processors may be developing solutions to this challenge.

Edible Beans

Edible beans are a surprisingly erratic market. Some varieties ("Small Reds" and "Black-eyed") remain well bid around the BZD 90.00/cwt while others like Light Red Kidney have trended downward BZD 75.00/CWT, despite all of the older season crop having been sold.

Rice

The Rice harvest is in and was broadly successful for farmers with irrigated fields. Domestic prices for rough/paddy rice remain stable at BZD 45.00/cwt (USD 495/mt), which continues to be a high premium relative to global market prices (USD 275/mt). Belize's rice farmers are entirely focused on selling in the (small) domestic market.

We are excited by the positive start to the Summer 2016 season, although it is very early days. If weather conditions are more "normal" than in 2015, we are confident that Cayo One will be able to demonstrate its considerable potential. Moreover, regional market conditions remain quite buoyant, despite generally weak prices for agricultural commodity prices on global markets. Once again, we retain all of our optimism for Belize's remarkable farming potential!

Thanks! - Abram Dyck, John Peters, and the Farming Report Editorial Team

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Grower	Location	Field #	Acres	Irr ?	Soil Type	Crop	Seed Variety (count/acre)	Plant Date	Stand Date	Fertilizer Program (For full details of applications, refer to Lot Records)	Comments
BSA	Cayo One	1a	14	N	Black	Corn (Yellow)	DeKalb 7088 27,000	June 1	June 7	Base 13.3-30.3-13.2-1.8S 330lbs/acre Liquid Aporte-M 2L/Acre TRIAL Vermiplex 4L/Acre	Land Preparation underway May 1, 2016; continues May 17, 2016 under good conditions; finished May 23. Planting June 1. Vigorous emergence June 5-10
BSA	Cayo One	1b	24	N	Black	Corn (Yellow)	Dow 3383 27,000	May 31	June 7	Base 13.3-30.3-13.2-1.8S 330lbs/acre Liquid Aporte-M 2L/Acre	Land Preparation underway May 1, 2016; continues May 17, 2016 under good conditions; finished May 23. Planted May 31. Vigorous emergence June 5-10
BSA	Cayo One	1c	24	N	Black	Corn (Yellow)	ASG R9000 27,000	May 31	June 7	Base 13.3-30.3-13.2-1.8S 330lbs/acre Liquid Aporte-M 2L/Acre	Land Preparation underway May 4, 2016; continues May 17, 2016 under good conditions; finished May 23. Planted May 31. Vigorous emergence June 5-10
BSA	Cayo One	2	284	N	Black	Corn (Yellow)	Dekalb 7088 27,000	May 28-31	June 7	Base 13.3-30.3-13.2-1.8S 330lbs/acre Liquid Aporte-M 2L/Acre	Land Preparation underway May 4, 2016; continues May 17, 2016 under good conditions; finished May 27. Planted May 28-31. Vigorous emergence June 5-10

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Lot Records for Fields 1 & 2

GROWER: <u>BSA</u>					Date Planted: <u>5/31/2016 - 6/01/2016</u>	
FARM LOCATION: <u>Cayo One Estates I</u>					SECTION #: <u>1a, 1b, 1c</u>	
CROP: <u>Corn</u>					BLOCK #: _____	
					SOIL TYPE: <u>Black Loam</u>	
					DK 7088;	
					VARIETY: <u>Dow 3383; ASG R9000</u>	
					# OF ACRES: <u>141+24+24</u>	

LAND PREPARATION					FERTILIZERS			PLANTING	
Discing	Harrowing	Leveling or Land Plane	Raking	Other	PREPLANT	AT PLANTING		Seed-Rate	Condition
5/1/2016					See Below		Aporte-M	27,656	Dry & Hot
5/16/2016	23-May-16	5/9/2016	4-May-16			See Below			
5/20/2016									

FERTILIZERS						Rain		PESTICIDES					
Date	Analysis	Rate/Ac	Ground	Air	#	Date	Quantity	Date	Description	Rate/Ac	Ground	Air	#
26-May-16	13.3-30.3-13.2-1.85	330lb	X		1	6/3/2016	0.6	3-Jun-16	Atrazine	1lb	X		3
31-May-16	Aporte-M	2L	X		2	6/5/2016	1.5	3-Jun-16	Prowl	1L	x		3
31-May-16	ermiplex (111 acres)	4L	X		2			13-Jun-16	ertero (perimeter only)	161 cc		x	4
								13-Jun-16	Aporté Pre-M	250 cc		x	4
								13-Jun-16	Damoil	250 cc		x	4

GROWER: <u>BSA</u>					Date Planted: <u>5/28-31/2016</u>	
FARM LOCATION: <u>Cayo One Estates I</u>					SECTION #: <u>2</u>	
CROP: <u>Corn</u>					BLOCK #: _____	
					SOIL TYPE: <u>Black Loam</u>	
					VARIETY: <u>DeKalb 7088</u>	
					# OF ACRES: <u>284</u>	

LAND PREPARATION					FERTILIZERS			PLANTING	
Discing	Harrowing	Leveling or Land Plane	Raking	Other	PREPLANT	AT PLANTING		Seed-Rate	Condition
5/5/2016					See Below		Aporte-M	27,656	Dry & Hot
5/10/2016	23-May-16	5/12/2016	6-May-16			See Below			
5/16/2016		5/17/2016							

FERTILIZERS						Rain		PESTICIDES					
Date	Analysis	Rate/Ac	Ground	Air	#	Date	Quantity	Date	Description	Rate/Ac	Ground	Air	#
20-May-16	13.3-30.3-13.2-1.85	330lb	X		1	6/3/2016	0.6	2-Jun-16	Atrazine	1lb	x		3
28-May-16	Aporte-M	2L	X		2	6/5/2016	1.5	2-Jun-16	Prowl	1Lb	x		3
								13-Jun-16	ertero (perimeter only)	161 cc		x	4
								13-Jun-16	Aporté Pre-M	250 cc		x	4
								13-Jun-16	Damoil	250 cc		x	4