

**Belize Sustainable Agriculture, Ltd.**  
**Joint Venture Farming Report – April 21, 2014**

**General Overview**

Weather conditions have been favourable for most farming activities: Indian Creek/San Carlos areas received between 1”-2” of rain late last week and through the weekend. Rice fields in Blue Creek received very little rain and the black eyed beans only slightly more. We experienced a real smorgasbord of night time temperatures, mostly cool with little humidity. Daytime temperatures have reached 34°C with most days having some wind. As a reminder, for those so inclined, you can follow Belize’s weather on:

<http://www.hydromet.gov.bz/250-km-radar-loop>

**Thiessen Family Farms – 512 acres (254 Irrigated / 258 Dry – 100% Corn)**

We are first continuing to report the results of the Thiessens’ Winter 2014 Red Kidney Bean crop as we still have not received a final count on the total “dried, cleaned, and sorted crop” which was sold. The last container is due to be collected this week for shipment to Jamaica.

The 215 acres (143 Irrigated / 72 Dry) of Red Kidney Beans (“LRK”) were planted December 9<sup>th</sup>, 17<sup>th</sup>, and 21<sup>st</sup>. The beans looked very good throughout the season; the seed was imported from the USA. Seed count at planting was 40,000 seeds/acre with an average of 34,000 plants/acre. We did plant-counts in numerous areas and at some acres we got as high as 38,000 plants /acre. Harvesting of the 215 acres of red kidneys is complete. We are waiting on the final yield report from the Thiessens which should be available after the cleaning/sorting/packing is completely done; they are expecting the total average to be around 1,500 lbs/acre, which represents a 50%+ increase versus historic yields achieved by the Thiessens. A first container of RK beans was shipped on March 13<sup>th</sup>, a second container shipped on March 25<sup>th</sup>, and the remaining beans representing about 1 ¼ containers are now scheduled to ship the week of April 21<sup>st</sup>. The (almost) final crop results were a crop cost of BZD 1,050/acre and a crop yield of BZD 2,575/acre for a superb net farming margin of BZD 1,525/acre.

Work has now begun on the Summer 2014 crop. The Thiessens have been able to increase their farmable land to 512 acres of red soil, mainly by renting additional land from Henry Fehr (In fact they are hoping to buy some 800 acres from Henry Fehr, but negotiations are proving fraught with difficulties). The 512 acres have two pivots, covering about 254 acres, so that the acreage is about 50% irrigated.

We had a long meeting with the Thiessens on April 19<sup>th</sup> where we discussed the forthcoming Summer Crop and prospects for a longer term relationship. We explained that BSA’s long term goal is to reach yields/acre on irrigated ground of 10,000/12,000lbs (~180-200 bushels) for corn; 3,000-3,500lbs (50-55 bushels) for soybeans; and 2,000-2,500lbs for edible beans. We stated that our expectation is that it will take 3-5 years to achieve these goals, which will require a multi-dimensional and incremental approach including significant improvements in:

- Soil Knowledge (regular soil testing)
- Seed variety and quality (fine tuning breeds and ensuring high germination rates)
- Optimizing Seed density and planting (higher densities planted with better equipment)
- Fertilizer programs (optimizing liquid/solid fertilizer blend at substantially higher levels with enhanced application techniques)
- Pest/Disease prevention, monitoring, & control.
- Harvesting technology (Better combining equipment, and significantly better drying equipment)

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On the one hand, we felt that the dramatic improvement in yields the Thiessens had experienced these past two crops gave us real credibility in terms of our commitment and willingness to provide financial, human, and knowledge resources to our JV partners. On the other hand, the Thiessens clearly felt daunted by the numbers we are talking about; one must remember that, historically, a 4,000lb/acre corn crop was considered to be a very satisfactory result in the Indian Creek Community.

However, at the end of the meeting, the Thiessens seemed excited and “Eager to Go”. They said they were working hard to get all of their land prepared in time for an early planting (mid-May) and readily consented to designating 50% of one of the irrigation pivots for a multi-phase trial involving two different corn varieties at different seed densities with different fertilizer blends (liquid/dry/foliar) and intensities. The rest of the acreage will be planted at a 30,000 seed/acre density (up from 25,000/acre of irregular quality seeds in Summer 2013), and fertilized for a 10,000lb/180 bushel crop with predominantly dry fertilizer (foliar usage to be determined). Soil samples have already been collected and corn seed will be germination tested by BSA prior to acceptance. A pest monitoring program, including traps and prophylactic spraying will be implemented for all of the acreage. More proactive schedules will be set for irrigation as well as higher frequency/lesser quantities of fertilizers. BSA will further support the Thiessens by providing a local agronomist to ensure very regular monitoring of crop conditions and pest presence, and to ensure the timely and complete maintenance of Lot Records.

We are very pleased to be entering a third season of JV farming with this dedicated, hard-working family group. 512 acres of intensive farming is the largest acreage they have managed to date, but we look forward to helping them grow their acreage, through additional acquisitions and rentals, in the coming years. We believe that they have the capacity to farm 1,000 acres in the near future and could eventually grow to be responsible for 2,000+ acres.

**Neufeld Family Farms – 336 acres total (100 acres black eyed beans - 0 % Irrigated / 236 acres Rice – 100 % irrigated)**

Jacob planted 70 acres BEB on February 18<sup>th</sup> and 30 acres on February 21<sup>st</sup> for a total of 100 acres. It’s hard to know what to say about these beans: some of them look fantastic, and some of them look very poor. Graded by a school teacher, they might get a 60%. The major issue is that the soil conditions into which these beans were planted are completely unsuitable for BEBs and work would definitely need to be undertaken if this acreage were rented again with the intention of producing a significant profit from BEBs.

On a more tactical note, the recent rain has created slight fungus issues on some of the greener pods. However, the rain will be beneficial overall allowing better pod fill. Bean size and cleanliness are very acceptable. Burn-down on the beans is slated for Saturday, April 26<sup>th</sup> or Monday, April 28<sup>th</sup> 2014, with harvest typically following in a week. There are patches of beans that have begun to dry down naturally, which frequently results surrounding beans maturing more quickly.

Barring weather or market disasters, the BEB crop should at least cover its costs, and may produce a modest profit. However, profitability would be an order of magnitude less than the Thiessens’ LRKs, and unlikely to be above BZD 100-200/acre.

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JSN Black Eye: Well Filled Pods (April 17, 2014)



JSN Black Eye: Mature Field (April 22, 2014)



JSN Black Eye: Individuals Beans (April 22, 2014)

**Rice**

Firstly, Jacob has some rice that is looking very pretty with impressive tillering! However, the majority of his fields have a grass control issue which is mostly attributable to poor land preparation. We note that the fields that received an early

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application of glyphosate post planting seem to be cleaner of grass and do not have the amount of grass escapes seen on the “non-glyphosated” ones. Herbicide applications are planned to bring this issue under control; it should be noted that water must be essentially gone on fields to not damage rice before these herbicide applications are done.

The earliest planted rice is fully in panicle initiation stage.

(<http://www.dpi.nsw.gov.au/agriculture/broadacre/summer-crops/rice/identifying-pi>)

This means that the amount of grain the plant will produce has been determined, and that any nutrient or water management strategy from here on will only impact filling of seed that is already present in the plant (which remains an important goal).

Jacob cannot let down his guard when it comes to maintaining water and nutrient levels; we had some very frank conversations with him recently and we are determined to get this problem under control. So far, Jacob has done a satisfactory job of maintaining water levels on his fields, but he will be encouraged to raise the levels a little after the next round of herbicides have been applied.

There are plans to spread nitrogen on all his fields on April 23<sup>rd</sup>. Jacob is also beginning to realize the benefit of foliar applications and these are planned as well as soon as practicable.



JSN Rice Field #121 at 49 days (April 22, 2014)

In closing, Jacob has so far appeared quite set in his ways and, for reasons which we believe are likely connected to inter-personal histories, seems resistant to accept input from the Hillbank Agricultural Company team (“HAC” - Dyck family farming company independently run by AD’s brother Peter Dyck, where MD and JP had been working). After an unsatisfactory first JV crop (mostly due to weather, but with some farming issues), we are closely evaluating Jacob’s performance in this second JV crop to determine whether he is a good long term candidate for our JV program.

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**Marlon Dyck – 420 acres (Rice 100 % irrigated)**

The initial 90 acres of rice that were planted (210 Series fields) continue to struggle; it seems as if insufficient seed vigor continues to affect these acreages. Due to this lack of vigor, some 10 acres were completely destroyed by algae. Recent applications of foliar are having a beneficial impact and these fields are continuing to improve. However, yield on these acres will not be as high as we would have liked but should still do well; it's just that we set high initial expectations for this entire JV crop! On a more positive note, grass or weed control does not presently appear to be an issue.

On a much brighter note, the remaining 320 acres of rice look very promising! Timely application of herbicide to control grass appears to have been very effective. Stand is impressive and vigor is much better than the earliest planted fields. However, procurement of good quality seed from a quality supplier, using a reliable logistics chain, is imperative for the next crop cycle. And while the vigor and germination from the locally supplied seed is much better than the earliest planted acreage, it still falls short of the best results seen in past years from prime US seed secured from top suppliers (however, in those years we did not need to make a last minute call to plant rice due to heavy unseasonal rains).

In general, the fields look good; however, better drainage with proper leveling would improve these fields by a further and significant margin! For the next crop cycle, acreage where we would plan on growing rice will go through a leveling program and drainage will be improved.



Marlon Dyck Rice Field 210 at 41 days (April 22, 2014)



Marlon Dyck Rice Field 232 at 23 days (April 22, 2014)

Early indications from Marlon's fields, notwithstanding a few glitches, are very encouraging. While we do not expect to return to HAC's record rice yields in this first season, we believe that average rice yields of 7,000 lbs/acre can be achieved, which will lead to very good profitability. Moreover, working with Marlon has provided us with a high degree of comfort regarding his farming skills, technological awareness, and total focus and drive.

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**Other Summer 2014 JV Farming Developments**

We are in various negotiations with other prospective partners for the Summer 2014 Season:

- **HAC** - rent ~600 acres of non-irrigated red soil in the San Carlos/Hillbank area. This ground would not be part of a JV program, but rather would be farmed by BSA personnel (MD, JP, and helpers.)
- **David Neufeld** (brother of Jacob Neufeld) – JV farm ~300 acres (with one pivot) of red soil in the San Carlos/Hillbank area if he can rent this land from Henry Fehr.
- **David Bergen** - JV farm (with option to purchase) ~440 acres of red soil (with two pivots) in the San Carlos/Hillbank area as a prelude to acquiring the land if purchase terms can be agreed.

**Summary and Conclusion**

The Thiessen Red Kidney was a resounding success. The 215 acres which we were able to plant, despite very adverse weather conditions (leaving 60 non-irrigated acres unplanted due to the heavy rains), produced yields that were over 50% higher than what local farmers (including the Thiessens) had historically achieved, with the promise of further yield gains in future years. The beans have all been harvested and all but one container have been sold and paid for; the last shipment should be completed this week. Farming profit/acre averaged an outstanding BZD 1,525!

We continue to look forward to the current rice crop with keen anticipation and continue to believe that this JV activity has strong potential this year. We are farming on ground that has a strong historic track record of producing excellent yields, and we are working with Marlon Dyck, one of Belize's foremost rice growers. Moreover, local prices for rice remain high and are likely to remain that way as the country has gone from a surplus to a material deficit in rice production these past three years. We are looking to lock in over half of our crop at current prices in "paddy" form (i.e. Rough Rice on the CBOT) that would be collected and paid for at harvest by a local merchant. We will confirm progress at the time of the next report.

We are also very much looking forward to the Summer 2014 Season. We believe that the experience acquired working with our JV partners, and the strengthening of our team with Marlon Dyck and John Peters arrival will put us in an excellent position, Mother Nature permitting as always, to deliver another significant increase in yields.

Lastly, corn prices were unchanged from last fortnight, although the Blue Creek Corn-Co-op is now making regular sales to Guyanese buyers at BZD 0.26/lb. Unfortunately, we have seen no detailed schedules of sales nor have we had any further funds released from the Co-op.

Thanks!

John Peters

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<b>Grower</b>	<b>Location</b>	<b>Field #</b>	<b>Acres</b>	<b>Irr?</b>	<b>Soil Type</b>	<b>Crop</b>	<b>Seed Variety</b>	<b>Plant Date</b>	<b>Stand - Date</b>	<b>Fertilizer Program</b>	<b>Comments</b>
<b>Thiessen Brothers</b>	SC	T1	24 16 <hr/> 40	Y	Sandy loam (Red)	RK Beans	Red Kidney (40,000 seeds/acre) Pink panther/ Clau Sue	Dec 9/2013	Harvested	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Harvested! – March 8-21 A successful end to the season, waiting for final yield data.
<b>Thiessen Brothers</b>	SC	T2	47 <hr/> 47	Y N	Sandy loam (Red)	RK Beans	Red Kidney (40,000 seeds/acre) Pink panther/ Clau Sue	Dec 17/13	Harvested	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Harvested! – March 8-21 A successful end to the season, waiting for final yield data
<b>Thiessen Brothers</b>	SC	T3	108 20 128	Y N	Sandy loam (Red)	RK Beans	Red Kidney (40,000 seeds/acre) Pink panther/ Clau Sue	Dec 21/13	Harvested	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Harvested! – March 8-21 A successful end to the season, waiting for final yield data
<b>Marlon Dyck</b>	San Felipe		80	N	Sandy loam	Milo	(seeds/acre)				Not planted due to weather
<b>Marlon Dyck</b>	Rio Bravo	210-212 220-225 231-236	420	Y	Heavy Black	Rice			Vigor issues		210-220-230 planted Significant Issues due to bad seed 210 Series only average 220-230 Very Promising
<b>Jacob S Neufeld</b>	San Felipe		209	N	Sandy Black	Black-eyed Beans	seed/acre				100 acres planted Feb 18-21 Looking mostly good, with about 30% suffering due to poor soil
<b>Jacob S Neufeld</b>	Rio Bravo	110-113 121-122	230	Y	Heavy Black	Rice	CHENIERE	5-6-7/3/14		15-15-15 75 lbs/acre 12-24-12 75lbs/acre	236 acres planted Some algae in 110s, one field, 122, suffered from poor seed, replanted. 121-122 now looking very good