

Belize Sustainable Agriculture, Ltd. Joint Venture Farming Report – May 19, 2014

General Overview

Weather conditions have been less than favourable for many farming activities during the course of the last two weeks, with a fair bit of rain over the region. This has resulted in delays in land work being completed in time for what is generally considered a very early rainy season. Humidity has been very high and care must be taken due to increased fungal pressures. Daytime highs have been in low 30°C with cool nights. Several cold fronts over the past few weeks are responsible for this precipitation. These are unusually late in the season and again contribute to the belief that wetter times are imminent and have left most farmers perplexed if this is a return to the early rainy seasons of more seasoned farmers. 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)

The final count on the Thiessen Light Red Kidney crop was 325,659 lbs., which is almost exactly 1,515 lbs./acre. Our cost of production was BZD 1,051 (USD 526) per acre and final revenue/acre should be almost exactly BZD 2,576 (USD 1288) as we only have about 11,000 unsold pounds. This produces an impressive profit/acre of BZD 1525 (USD 763), and a total profit for BSA of BZD 163,938. Both the Thiessens and the BSA team are thrilled and we look forward to a bigger and better LRK crop in the winter of 2015.

The Thiessens continue to work on preparing for the Summer 2014 crop. They have been able to apply the majority of the preplant fertilizer as planned. This is followed by a light discing to incorporate the fertilizer into the shallow root region of the upcoming plant. The fertilizer being applied as a preplant is 12-26-14, which is a very commonly available formula and provides a basis for later applications. We are finally in receipt of our long awaited soil analyses and these show this soil to be in generally good condition. Some elements are present in abundance and others are on the low side. **Nitrogen is extremely low as might be expected after all the rains whereas levels of most other nutrients including phosphorus and potassium are available in sufficient enough amounts that a huge expense will not need to be incurred to bring these levels up where we can reasonably expect a crop. Many of the micronutrients that are needed for corn (S, Zn, Fe, Cu, B) are also amply present, so the nutrient management appears to be easier than first thought.** It must be remembered that all nutrients need to be in balance and just the mere presence of one or the other does not guarantee sufficient uptake into the plant. Leaf tissue analysis will be used to pinpoint any nutritive deficiencies which can be quickly and readily corrected with the use of foliar applications. We intend to manage crop nutrition much more proactively than in the Summer 2013 crop, and we believe that we now have the Thiessens fully on board for this. As the crop evolves, the remainder of the plants' requirements will be met by a combination of additional dry and liquid applications at planting and later during the crop through multiple vectors including foliar fertilizers.

The Thiessens have readied their existing equipment as well as bought a few additional units in order to be well prepared for planting, including a large wheeled fertilizer spreader which will make their work much easier and quicker. It is expected that the addition of a few more such pieces will make their work not only easier, but also much more efficient. One must bear in mind that for traditional communities such as Indian Church, the traditional sense in which they have grown up viewed making things easier not necessarily a matter of being more efficient but rather a sign of laziness. We have been helping them think "the more a man produces the more he is worth", a slow process that is finally beginning to pay off. Helping them see how much more they can produce with small steps as these will help ensure their success and ours!

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We believe the Thiessens are now fully aware of BSA's goals and, importantly, we also believe they are now fully on board with these plans. It seems that they welcome our visits more and more and are eager to discuss and learn from us. We too enjoy the camaraderie and we are delighted at the chance to help them flourish and prosper.

Reflecting Belize's meteorological microclimates, the Thiessens have enjoyed great weather overall this past fortnight, with a few small rain showers over the last week or so. While this has slowed down their land preparation slightly, as they need to wait a short while after each rain, another good day of sunshine and they should be complete with this phase of land work. The arrival of the land plane is expected this week and a few days with this large piece of equipment should complete the land preparation.

We have no new pictures of Thiessen activity this week as these would show mostly the same fields as in last fortnight's report, so we have included examples of the two major new pieces of equipment the Thiessens have acquired.



Fertilizer Spreader



Land Plane

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

Black Eyed Beans

JSN was able to harvest his black eyed beans between May 8th and 12th. During the past fortnight, the BEB fields experienced several downpours before he was finally able to get his harvester into the field. These rains knocked down many of the plants so that the combine had considerable difficulty picking them up. Accordingly many of the pods were left lying on the ground, with the result that that we had a dismal harvest of only about 55000 lbs. The one consolation is that, despite the rains, the beans had been sprayed early enough to dry them down and the usual resulting green tint that occurs from the pod getting wet is absent. In fact, the beans have a great appearance with a better than average white color and size. The yield per acre, using the 70 acres that were effectively producing beans (30 acres proved to have soil characteristics that made them very “bean unfriendly”), was a very modest 800lbs, compared with our target of 2,000 lbs. Unfortunately, it is very hard for us to evaluate what percentage of the BEB crop remained un-harvested on the field. While we understood the risk we were taking in planting BEBs as late as February 18th, it is unfortunate that these rains came so early in the season and hit JSN's fields so hard. By comparison, the Thiessens fields, which are about 14 miles away as the crow flies, only received a fraction of the rain that fell on JSN. Such are the vagaries of Mother Nature!

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We expect that the final crop cost will be about BZD 85,000 and that we will get no more than BZD 45,000 for our BEBs (The domestic market for BEBs is currently slow and we are looking at multiple avenues to dispose of them, including exporting a container load). So BSA will realize a loss on these 100 acres, which although modest, is a disappointment. We will also review all aspects of how this crop was handled and draw as many lessons as possible for future BEB crops.

Rice

The earlier reservations with grass control have been put aside as the new herbicide did a fantastic job of controlling late season emergence.

Jacob's earliest planted rice is in full heading stage. The earliest panicles were observed on May 3, 2014. These fields were planted on March 3, 2014, so this is considered right on time! The not so good news is that the heading is usually considered best if the complete crop heads in a 3-4 day window whereas ours is taking longer. While this is not considered to be a major problem, it could cause some harvesting issues if the heading is too far stretched out from beginning to end. There is also an abundance of "red rice", which can cause lodging issues upon maturity and take other rice with it when it does lodge. The seed selection for next years rice crop will definitely need to include the "Clearfield" varieties in order to get control of this ever more burdensome crop pest.

The final applications of nitrogen have been applied, so maintaining water levels until just the correct time is imperative. Of course if the rain does not stop then there is less control that can be exercised, in which case the harvest could be more difficult. The other area where continued vigilance is essential is pest management. Spinki Mites are a particular problem during periods of greater rainfall. http://en.wikipedia.org/wiki/Steneotarsonemus_spinki Jacob has been encouraged to make very frequent inspections and to carry a magnifying glass into the field to get a closer look.

Overall, Jacob's rice yield potential continues to be good/excellent, and has improved considerably since the beginning of the season. We continue to enjoy good cooperation from Jacob but do feel that some machinery upgrades on his part would greatly reduce his energy spent on keeping his fields under water.



JSN Rice Field (May 17, 2014)



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Marlon Dyck – 420 acres (Rice 100 % irrigated)

The initial 90 acres of rice that was planted (210 Series Fields) is continuing to show signs of increased yield potential. It is in full panicle initiation stage and we should see panicles begin to emerge in about a week. The verdant green these fields have maintained is almost unbelievable. They are evenly dark green with no lighter colored streaks. This, along with a completely even height, makes this an almost picture perfect field. We say almost because isolated weeds have begun to emerge in areas. Unfortunately at this development stage there is nothing that can be done short of manually roguing the problem areas.

The later planted (March 29) rice is tillering vigorously. The rains have helped maintain sufficient water levels without the need for pumping, which is a helpful reduction in pumping costs. Coincidentally, rainwater still seems to be more “beneficial” and also seems to last longer in the field, than the river water we pump. Of course, too much water can make the plant grow adversely tall and reduce its stand-ability.

Pest management has been unusually light this year. We are not sure why but we will take it! This has been true in Jacob’s fields as well.

We continue to believe our potential for a 7,000 lb yield is achievable, despite this being the first year rice has been produced on these fields in several years. And we believe that longer term goals of 8,000 lb+/acre can be achieved. We have no doubt that Marlon’s diligence in the field will pay off, and he is being encouraged to ensure that his harvesting equipment will be fully ready for a big crop when his rice is ready for harvest.

Other Prospects

We continue to be in various negotiations with other prospective partners for the Summer 2014 Season:

- **HAC** – rent ~650 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.). We continue to make progress towards a satisfactory agreement, and expect to begin land preparation shortly.
- **HAC** – rent ~280 acres of non-irrigated sandy black soil in the Blue Creek area, almost adjacent to our current rice crops. Here too, we continue to make progress towards a satisfactory agreement, and expect to begin land preparation shortly.
- **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 has chosen to work with others for this crop and we are removing this prospect from our list.
- **John 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. While the purchase opportunity now seems unlikely, John has approached us to JV the farm with him this season. After further consideration, we will not move forward with this JV as John’s price expectations for his land are unreasonable.

Summary and Conclusion

With the “on-farm” activities mostly complete for the Winter 2014 season (except for rice!) we are putting more effort into marketing the remaining grains we have in storage (Corn, BEBs, and small amount of LRKs). Maintaining these in storage is not only costly, but it also carries some degree of risk. While seeing a harvest go into the bins is a very good

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feeling, having a crop that is sold with the “money in the bank” is an even better feeling! We are using the time and available inventory (ours or our JV partners) to explore direct sales of LRKs to Jamaica (cutting out middlemen) and selling corn into Guatemala via the official quota contained in the Belize Guatemala Partial Scope Agreement. We believe that these efforts will play an essential part in securing better markets for us as we sharply increase production over the next several years.

We continue to look forward to the current rice crop with keen anticipation and continue to believe that this crop has strong potential this year and into the future. We have secured the sale of our entire 2014 rice crop to a reputable merchant in Orange Walk District, who has (for the first time in his business career) provided a grower (in this case BSA) with both a written purchase agreement and an initial signing deposit. We have locked in the crop at BZD 0.37/lb ex the field, which compared to production costs that should range around the BZD 0.23/lb, would allow for an excellent farming margin of about BZD 1,000/acre (USD 500), assuming a 7,000lb./acre yield. Our major remaining risks are a weather catastrophe or a pest invasion. The former is in the hands of Mother Nature, but we are being extremely vigilant for the latter.

Thanks!

John Peters

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Grower	Location	Field #	Acres	Irr?	Soil Type	Crop	Seed Variety	Plant Date	Stand Date	Fertilizer Program	Comments
Thiessen Brothers	SC	T1	131	TBA	Black-red loam	Corn	Dekalb 7088			150lb 14-36-12	Summer 2014 Crop – waiting for rains to start planting
Thiessen Brothers	SC	T2	139	TBA	Black-red loam	Corn	Pioneer 4226			150lb 14-36-12	Summer 2014 Crop – waiting for rains to start planting Reviewing Germination results
Thiessen Brothers	SC	T3	51	TBA	Red	Corn	Syngenta Impacto			150lb 14-36-12	Summer 2014 Crop – waiting for rains to start planting
Thiessen Brothers	SC	Extra	52	TBA	Red	Corn	Dekalb 7088			150lb 14-36-12	Summer 2014 Crop – waiting for rains to start planting
Thiessen Brothers	SC	Extra	139	TBA	Red	Corn	61 ac Syngenta Impacto 79 ac Dekalb 7088			150lb 14-36-12 + liquid	Summer 2014 Crop – waiting for rains to start planting Trial Plot managed by Marlon Dyck
Marlon Dyck	San Felipe		80	N	Sandy loam	Milo	(seeds/acre)				Winter 2014 Not planted due to weather
Marlon Dyck	Rio Bravo	210-212 220-226 231-237	420	Y	Heavy Black	Rice	Cheniére local supplied	March 12/14- March 31/14	Vigor issues	Base of liquid ferts 81lb 40-0-0-6s 68lb 10-36-10-6.8s-.9zn 75lb 40-0-0-6s 75lb 10-36-10-6.8s-.9zn 100lb 40-0-0-6s 30lb 10-40-5-7s-7zn	210-220-230 planted Significant Issues due to bad seed 210 Series now much improved 220-230 Very Promising
Jacob S Neufeld	San Felipe		209	N	Sandy Black	Black-eyed Beans	seed/acre				100 acres planted Feb 18-21 Looking mostly good during growth, with about 30% suffering due to poor soil Harvest completed under rainy conditions; crop was only 55,000 lbs due to rain impact on bean pods

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Jacob S Neufeld	Rio Bravo	110- 114 121- 123	230	Y	Heavy Black	Rice	CHENIERE	5-6- 7/3/14		65lb 15-15-15 65lb 12-24-12 50lb 40-0-0-6s 30lb 13-11-21-2s 50lb 40-0-0-6s 50lb 46-0-0 30lb 19-4-19+mg 50lb 40-0-0-6s 50lb 46-0-0 30lb 13-11-2 75lb 40-0-0-6s	236 acres planted Some algae in 110s, one field, 122, suffered from poor seed, replanted. 121-122 now looking very good
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