

Belize Sustainable Agriculture, Ltd.
Joint Venture Farming Report – February 10, 2014

General Overview

This is the first report on BSA's Winter 2013/14 farming season, which will now be on a fortnightly basis. Reporting was delayed due to the very limited amount of crops that BSA's JV partners were able to plant owing to the very wet conditions prevalent through late January 2014.

The end of the 2013 "Wet Season" (June-Nov) and start of the 2013/2014 "Dry Season" (Dec-May) are, according to the Belize National Meteorological Service, among the wettest since 1981 when BNMS began record keeping. This affected both the harvest of our Summer 2013 crop and our ability to plant the Winter 2013/2014 crop. Only the fast draining "red soil" found in the San Carlos district of Orange Walk provided a window of opportunity for planting. The rich black soil in the Blue Creek district of OW is only just approaching readiness for planting as it remains quite wet.

Weather conditions in the past fortnight continue to include intermittent rain showers, which has not allowed land in the Blue Creek district to fully dry out. We continue to hope for a run of several days of dry breezy weather to allow this ground to finish drying out. On the other hand, the intermittent rain has been very helpful for the red soils where we have been able to plant. Soil moisture remains "Wet" in Blue Creek and "Moist" in San Carlos.

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 – 215 acres Red Kidney Beans (143 acres Irrigated - 72 acres Dry)

The Thiessens originally targeted 285 acres for planting Red Kidney Beans ("RKs") in the San Carlos district between late November and late December. Unfortunately, weather conditions were only dry enough for a few days of planting during that period, allowing only 215 acres to be planted. Following their very successful Summer 2013 corn crop, where the Thiessens experienced a 40% improvement in corn yields thanks to much higher fertilizer applications, more aggressive agri-chemical management, and modestly higher planting seed count, the Thiessens vigorously embraced BSA's much more intensive and forward looking planting/management program for the RKs.

RKs were planted December 9th, 17th, 21st, 2013. This crop was chosen due to strong demand from Jamaica at historically high prices for very large quantities, as well as consistent domestic Belizean demand at even higher prices albeit for more limited quantities. Seed was imported from the USA to ensure higher quality, with seed count at planting of approximately 40,000 seeds/acre. This represents a 60% increase on seed counts traditionally used by the Thiessens and their neighbors. Several plant counts were taken across multiple areas in the 215 acre zone, with an estimated average of 34,000 plants/acre, with some readings as high as 38,000 plants/acre, about double the levels historically achieved. The fertilizer program comprises both a substantial starter fertilizer application and regular foliar fertilizer applications, the latter typically sprayed in conjunction with insecticides and other agri-chemicals. This is a much more intensive and pro-active fertilization program than the Thiessens or any of their neighbors have ever attempted on edible beans.

It is interesting to note that farmers surrounding the Thiessen JV fields have planted RK seeds both from the USA and from locally collected sources. The imported US seed is definitely performing better up to this stage, although the lack of modern planting equipment might also have played a role in the lower than desired germination rate of some of the domestic seed. Having seen other fields planted by Marlon Dyck with a GPS precision planter, the Thiessens have asked BSA to obtain his assistance for planting their entire Summer 2014 crop.

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As of February 7th, the Thiessen RKs are looking very good indeed, and the harvest is projected to start on February 17th, although this can change subject to weather.



Thiessen RK Beans (Feb 7, 2014)



Thiessen RK Beans - Zoom on Pods (Feb 5, 2014)



Thiessen RK Beans - Irrigation (Feb 7, 2014)



Thiessen RK Beans - Pod count (Feb 7, 2014)

Preliminary Yield Estimates for Thiessen RK Beans

We sampled 10 plants across various parts of the fields, and found an average of 17.5 pods per plant, with 3.4 “good” beans per pod. Using a 34,000 plant/acre count, the theoretical yield would be $34,000 \times 17.5 \times 3.4 = 2,023,000$ beans/acre. Using an average of 700 beans/lb, we would project a yield of 2,890lbs/acre. As this would represent an increase of over 150% from historic levels, we are not quite ready to forecast quite such a dramatic yield improvement.

Yield Estimate (Feb 7, 2014) for Thiessen RKs: 1,600 to 2,400 lbs/acre

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Neufeld Family Farms – 446 acres: 210 acres Blackeyed Beans (0 % Irrigated); 236 acres Rice (100 % Irrigated)

Jacob Neufeld is scheduled to farm some 446 acres of black soil in the San Felipe and Blue Creek Districts of Orange Walk. As of February 7, 2014, all of the fields have been “burned down”, but the soil remains too wet to be prepared or planted. The deadline for planting the Blackeyed Beans is February 15th, as beans must be harvested during dry conditions, and a 75 day crop like BEBs should not be planned for harvest after May 1 when Wet Season rains can resume. Rice has more flexibility, as it can be harvested under wetter conditions, and the rice fields are not currently scheduled for a summer crop.

The next report will be able to confirm whether the BEBs have been planted or abandoned, as well as what the expected timetable is for planting the rice crop.



Jacob Neufeld Rice Field (Feb 7, 2014).



Jacob Neufeld Rice Field (Feb 7, 2014)

As can be seen in the pictures above a burn down has been applied. We are waiting for this ground to dry up for land preparation. In the second picture drainage ruts have been made to assist draining. We would ideally have liked to have completed rice planting by mid-late January but due to weather nothing has been planted so far.

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Marlon Dyck - 500 acres: 420 acres Rice (100% Irrigated); 80 acres Sorghum (0% Irrigated)

Marlon is a young yet already highly experienced farmer who has the strongest grasp of modern “Precision Farming” technologies within the Orange Walk farming communities. He has also produced record rice crops in Belize, with yields regularly reaching 4mt/acre.

Marlon’s 420 acres scheduled for rice are located close to Jacob Neufeld’s rice fields and are in a similar condition; as with Jacob, Marlon has been waiting for dryer weather to finish working his land and planting his rice.

The 80 acres scheduled for Sorghum have now been abandoned for this Winter 2013/2014 season. The deadline for planting Sorghum, a 120 day crop, is mid/late January, especially on non-irrigated ground.

Summary and Conclusion

We continue to be very pleased with how the Thiessen RKs have progressed, and with the entire Thiessen relationship. We look forward to a successful Winter 2013/2014 season and to the prospects of substantially increasing our JV acreage with the Thiessens during the Summer 2014 season. We are greatly encouraged by their preliminary yield estimates, although we are wary of forecasting increases beyond 100% above historical levels, which would already be a phenomenal achievement.

We are on standby for our remaining fields. We feel confident that we will be able to plant the 656 acres of rice, and that the economics of the crop will be very favorable. We are becoming worried as to the BEBs with Jacob Neufeld. The next week’s weather will be determining. For the record, we abandoned some 400 acres scheduled for planting with Pete Dyck as his black soil located in the western part of the Blue Creek district was so waterlogged it was clear by early January that it would not be ready for planting this season. Thus of the approximately 1,600 acres we had scheduled for JV planting in the Winter 2013/2014 season, we will probably only plant some 900 acres. However we expect excellent economics from these acres, so these season should still show a very nice profit (subject, as always, to weather!)

Prices for RKs remain very firm, with Jamaican buyers offering BZD 1.60/lb (FOB farm gate) for container (20mt) quantities, and Belizean wholesalers and markets offering BZD 2.50/lb for 100lb bags. This would generate BZD 4,000/acre assuming mid-range yields and prices, versus production costs of BZD 800-1,000/acre.

Prices for rice remain highly attractive; with “paddy rice” being bid at BZD 0.32-0.40 (FOB farm gate) and “polished rice” being bid at BZD 0.80/lb (CIF Wholesale); the latter market is for limited quantities sold in the Belizean domestic market. These prices would generate BZD 2,500/acre (paddy) and BZD 4,000/acre (polished) assuming mid-range yields and prices, versus production costs of BZD 1,200-1,400/acre (paddy) and BZD 2,200 to BZD 2,500/acre (polished).

Thanks.

Ruben Froese

As a reminder: USD 1.00 = BZD 2.00

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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	24 16 <hr/> 40	Y N	Sandy loam (Red)	RK Beans	TBA – Red Kidney (40,000 seeds/acre)	DEC 9/2013	23"-2/7	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Feb 7: Beans looking very good
Thiessen Brothers	SC	T2	47 0 <hr/> 47	Y N	Sandy loam (Red)	RK Beans	TBA - Red Kidney (40,000 seeds/acre)	Dec 17/13	23"-2/7	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Feb 7: Beans looking very good
Thiessen Brothers	SC	T3	108 20 <hr/> 128	Y N	Sandy loam (Red)	RK Beans	TBA – Red Kidney (40,000 seeds/acre)	Dec 21/13	23"-2/7	14-36-12 35.8lbs/acre 18-46-0 79.3 lbs/acre	Feb 7: Beans looking very good
Marlon Dyck	San Felipe	TBA	80	N	Sandy loam	Milo	Sorghum (seeds/acre)				Feb 7: Abandoned; ground too wet
Marlon Dyck	Rio Bravo	210-212 220-225 231-236	420	Y	Heavy Black	Rice	TBA – Rice (seeds/acre)				Feb 7: Not yet planted; ground too wet but still likely to be planted
Jacob S Neufled	San Felipe	TBA	209	N	Sandy Black	Black-eyed Beans	TBA – B.E.B. (seeds/acre)				Feb 7: Not yet planted; ground too wet but still possible but not likely to be planted
Jacob S Neufled	Rio Bravo	110-113 121-122	230	Y	Heavy Black	Rice	TBA – Rice (seeds/acre)				Feb 7: Not yet planted; ground too wet but still likely to be planted