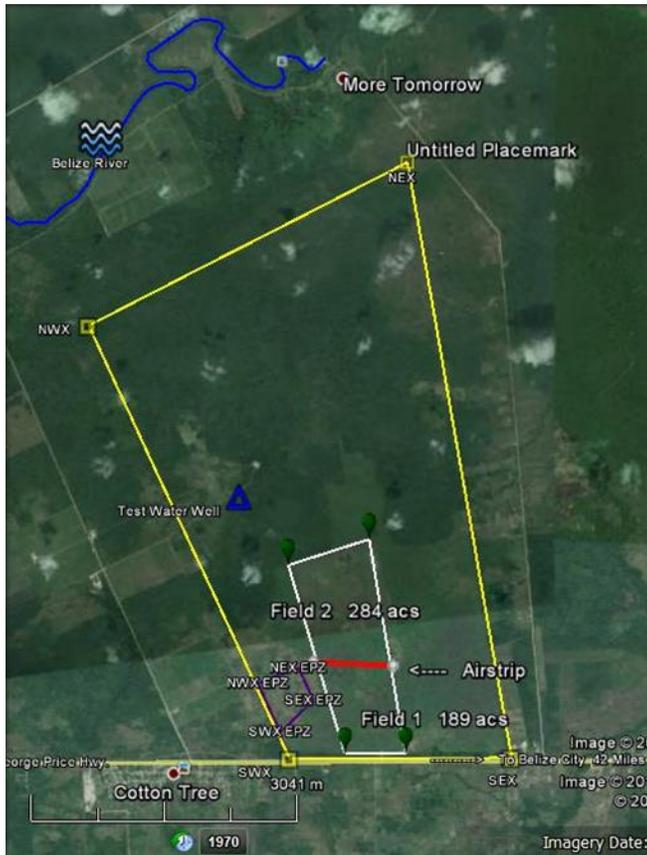


Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

General Comments & Weather



This is the twelfth 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.

September 2016 began on a somewhat clement note, with mostly dry and warm days, and then the last ten days of the month were disappointingly wet. So while September saw statistically “normal” rainfall, we did not have the drier weather required to move forward with early harvesting. We are in the peak season for hurricane activity; so far there continue to be no immediate threats to Belize and no early stage cyclone formations that models indicate might head towards the western Caribbean.

Belmopan Precipitation Data (mm per month) – October and YTD Data through October 3 rd													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	YTD	Nov	Dec
2016	105	282	30	66	71	414	175	349	231	14	1723		
2000-2015	141	51	50	30	127	261	261	228	230	269	1431	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>

Belize Sustainable Agriculture, Ltd.
Farming Report – October 4, 2016

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

This report is brief as most of our activity is now focused on the start of harvesting (Mother Nature permitting)

Farm Operations

Land Preparations

These were timely completed, and a full description is provided in the Lot Records at the end of this document.

Weather Analysis

During the last ten days of September, rainfall picked up, with some 110mm coming down right as we were getting ready to start harvesting. We notably had two days with 20+mm downpours that were enough to soak the corn and the ground, so that harvesting had to be postponed. Temperatures are down to a seasonally average 89°F (32°C); the forecast is for cooler (86°F / 30°C) weather.

Seed Selection, Planting, and Crop Development

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) @ 27,656 seeds/acre
- Dow 3383 - 24 acres (Part of Field 1) @ 27,656 seeds/acre
- American Seed & Genetics R9000 - 24 acres (Part of Field 1) @ 27,656 seeds/acre

DeKalb DK-7088 Comments

We continue to be quite impressed with how well the DK-7088 has survived a combination of challenging early season weather and Hurricane Earl. We hope that Monsanto will be able to overcome its seed quality control problems next year and we were pleased with the constructive solution they offered to address their 2016 quality control issues.

Dow DAS-3383 Comments

The Dow DAS3383 has been a disappointment. Although we will wait until after harvest to look at final crop results for the DAS-3383, the likelihood of this variety being in next year's plantings is slim.

ASG RY-9000 Comments

The ASG RY9000 will mature close to a full month behind the DK-7088 and will be the last variety harvested. While we will wait for our final yield results before making a decision, it is unlikely that we will plant this variety again.

Fertilizer Program

The BSA fertilizer program was completed on August 8th. For a detailed discussion of BSA's fertilizer strategy, please see the May 31, 2016 Farming Report.

General Plant Development

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

Dry down of the corn ears in the field was modestly reversed due to increased rainfall. We expect to reach 28% by the end of the first week in October. The plants are trying to continue their natural cycle of senescence. Indeed, there is very little life left in the plants at this stage so we are anxious to begin harvesting as soon as moisture conditions allow.

Insects

We are now outside of the “risk zone” when significant crop damage can occur due to insect activity.

Funguses and Bacteria

There continues to be widespread Eyespot Fungus in the fields, although there is little that can be done at this juncture. Given that this season’s corn is destined to be animal feed, we do not expect any issues from fungus.

For a detailed discussion of BSA’s fungus situation, please see the September 19, 2016 Farming Report.

Weeds

Weeds remain an issue and we applied a round of herbicide (Glyphosate/Heat) on the first part of Cayo 1 to be harvested to knock down as much of the weeds as possible. We remain very disappointed by the quasi failure of our initial application of the Bayer Prowl product and will be actively considering alternative products for the next corn crop.

As far as our three corn varieties are concerned, there continue to be some stark differences between the various trials. We expect to report harvest dates and yields in four weeks’ time.

Harvest

BSA had planned to begin harvesting on September 26th, which is earlier than usual, but late September rains delayed the start. We now expect to start harvesting on October 6th or 7th.

For a detailed discussion of BSA’s harvest strategy, please see the September 19, 2016 Farming Report.

As a reminder, our corn will be transported to Blue Creek to be dried by Hillbank Agricultural Company. It has been pre-sold to the Northern Grain Co-op in Blue Creek. This is a change from earlier plans that had us field drying our corn at Cayo One and transporting dry corn to Blue Creek for delivery to NGC.

We continue to expect yields to be 20% to 40% lower than originally budgeted, due to the combination of bad DK-7088 Seed and Hurricane Earl Damage. However, if we harvest ~1.75–2.0 mt/acre (~70-80 Bu/acre) we will consider this an achievement considering the above two issues. As a reminder, Hurricane Earl passed directly over Cayo One!

Winter 2016/17 Season

BSA continues to anticipate planting Field 2 (approximately 284 acres) with Cardi-1088 and 3296 soybeans for the Winter 2016/17 season. Soybean seed has been reserved in sufficient amount from the grower. The 3296 has been a longstanding preferred local variety for winter crops and the Cardi-1088 is preferred for summer planting; the intention is to grow a small acreage of this variety as seed stock for a potential summer crop in 2017.

BSA will be focused on installing drain tile on the entire southern portion of Cayo One, which includes Field 1.

Belize Sustainable Agriculture, Ltd.
Farming Report – October 4, 2016



Cayo One Southwesterly view from Field 2 – Oct 4, 2016
Weeds (green) have not been sprayed in NE section



Cayo One Southern Corner of Field 2 – Oct 4, 2016
This section was sprayed and weeds are mostly dead



Cayo One Northwesterly view from Field 1 - Oct 4, 2016
Area south of runway has not been sprayed yet



Yalbac Ranch (Spanish Lookout) – Oct 4, 2016
Zoom in to see how Combine is searching for corn to harvest



Combine Tracks being cleaned of heavy mud – Oct 4, 2016
Fields were too wet last week: even tracks got bogged down!



Header being checked/lubricated – Oct 4, 2016
Equipment purchased (cheap!) in Canada arrived just in time!

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

Market Conditions and Conclusion

Corn

We have received further anecdotal reports out of Cayo District, which typically produces about 75% of Belize's corn, and they are now consistently dismal. We believe that previous reports of some farmers achieving outstanding yields were nonsense, and that the reality of the 2016 summer season's debacle is becoming increasingly apparent. One of the photos shows a combine searching for harvestable corn in a vast field, with little success!

We have also begun to hear more from Belize's northern corn growing communities, which represent about 25% of the country's corn growing capacity, who had been talking about a very good (for them) harvest (2.0-2.5mt/acre). However, early combine reports are much less positive. We believe that while the corn plants will have recovered well from Hurricane Earl, many of the ears will not have filled properly due to the plant stress; hence the disappointing yields. We should also point out that the northern communities do not undertake any type of scientific field/yield analyses. Their early enthusiasm was likely due to healthy looking plants and a tendency for farmers to pick the best looking ear they see when evaluating their crop...

The market for corn in Belize remains at its modestly softer level, in the BZD 26.5-27.5/cwt range (\$7.56/Bu - \$298/mt), albeit with little trade. However, we fully expect this softness to be short lived as the reality of the country's major corn crop losses in the key Cayo District becomes evident. As a reminder, we committed our crop to a Belize co-operative where it should achieve an excellent price, likely at or above \$7.70/Bu - \$300/mt.

Belize and the region's prices compare VERY favorably to the current bids at US grain elevators of \$3.00-\$3.20/Bu (~\$125/mt), which is what US farmers will be paid (before US Gov't price support payments).

Soybeans

Soybeans remain unchanged and continue to be very quiet with limited reported trades. #1 Grade Soybeans continue to be bid at BZD 50.00/cwt (\$550/mt), and lower grade #2 soybeans remain steeply discounted below BZD 40.00/cwt. (\$440/mt).

Edible Beans

Edible beans continue to be inactive as they are sold out in Belize, except for blackeyed beans. There has been no recent price talk but we continue to believe that new crop beans would trade in the \$40-\$50/cwt.

We continue to look forward to a decent harvest, especially in light of the circumstances. We very much look forward to the next Dry Season where we will substantially increase our farmed acreage and install our first drainage systems!

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

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

Grower	Location	Field #	Acres	Irr ?	Soil Type	Crop	Seed Variety (count/acre)	Plant Date	Stand Date	Fertilizer Program <i>(For full details of applications, refer to Lot Records)</i>	Comments
BSA	Cayo One	1a	14	N	Black	Corn (Yellow)	DeKalb 7088 27,656	June 1	June 7	Base 13.3-30.3-13.2-1.8S <u>330lbs/acre</u> Liquid Aporte-M <u>2L/Acre</u> TRIAL Vermiplex <u>4L/Acre</u> 46-0-0 <u>100 lbs./acre</u> 38.5-0-0-7.2S <u>136lbs/acre</u> 46-0-0 <u>110 lbs./acre</u>	Land Preparation underway May 1, 2016; continues May 17, 2016 under good conditions; finished May 23. Planting June 1. Vigorous emergence June 5-10. Above average June 25 plant count for DK-7088 at 24,000/acre. Clear signs of water stress after very wet June; starting to dry out / July 11. Major improvement by late July; Early tasseling. Very healthy plants, mostly pollinated. moderate hurricane damage, still a promising crop / Aug 9. Encouraging field survey that shows large quantity of ears that will be smaller than average / Aug 23. Additional rain damage; crop approaching maturity / Sep 5. Almost ready for early harvest humidity @ 29% / Sep 19 Rains pushed back Harvest start date by 2 weeks / Oct 4
BSA	Cayo One	1b	24	N	Black	Corn (Yellow)	Dow 3383 27,656	May 31	June 7	Base 13.3-30.3-13.2-1.8S <u>330lbs/acre</u> Liquid	Land Preparation underway May 1, 2016; continues May 17, 2016 under good conditions; finished May 23.

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

										<p>Aporte-M <u>2L/Acre</u> 46-0-0 <u>100 lbs./acre</u> 38.5-0-0-7.2S <u>136lbs/acre</u> 46-0-0 <u>110 lbs./acre</u></p>	<p>Planting June 1. Vigorous emergence June 5-10. Above average June 25 plant count for DK-7088 at 24,000/acre. Clear signs of water stress after very wet June; starting to dry out / July 11. Major improvement by late July; Early tasseling. Very healthy plants, mostly pollinated. moderate hurricane damage, still a promising crop / Aug 9. Disappointing field survey shows insufficient ears that will be small / Aug 23. Additional rain damage; crop approaching maturity / Sep 5. Almost ready for early harvest humidity @ 29% / Sep 19 Rains pushed back Harvest start date by 2 weeks / Oct 4</p>
BSA	Cayo One	1c	24	N	Black	Corn (Yellow)	ASG R9000 27,656	May 31	June 7	<p>Base 13.3-30.3-13.2-1.8S <u>330lbs/acre</u> Liquid Aporte-M <u>2L/Acre</u> 46-0-0 <u>100 lbs./acre</u> 38.5-0-0-7.2S <u>136lbs/acre</u> 46-0-0 <u>110 lbs./acre</u></p>	<p>Land Preparation underway May 1, 2016; continues May 17, 2016 under good conditions; finished May 23. Planting June 1. Vigorous emergence June 5-10. Above average June 25 plant count for DK-7088 at 24,000/acre. Clear signs of water stress after very wet June; starting to dry out / July 11. Major improvement by late July; Early tasseling. Very healthy plants, mostly pollinated. moderate hurricane damage,</p>

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

											still a promising crop / Aug 9. Disappointing field survey shows insufficient ears that will be small / Aug 23. Almost ready for early harvest humidity @ 29% / Sep 19 Additional rain damage; crop still ~ 6 weeks from maturity / Sep 5. Rains pushed back Harvest start date by 2 weeks / Oct 4
BSA	Cayo One	2	284	N	Black	Corn (Yellow)	Dekalb 7088 27,656	May 28-31	June 7	<p>Base 13.3-30.3-13.2-1.8S <u>330lbs/acre</u></p> <p>Liquid Aporte-M <u>2L/Acre</u> 46-0-0 <u>100 lbs./acre</u> 38.5-0-0-7.2S <u>136lbs/acre</u> 46-0-0 <u>110 lbs./acre</u></p>	Land Preparation underway May 4, 2016; continues May 17, 2016 under good conditions; finished May 27. Planted May 28-31. Vigorous germination but irregular emergence June 5-10 followed by disappointing June 25 plant count at 22,500/acre. After June's heavy rainfalls Field 2 also showed the highest amount of ponding as of July 11. Major improvement by late July; Early tasseling, even in areas with bad seed. Mostly healthy plants, mostly pollinated / July 25. Moderate hurricane damage, still a promising crop / Aug 9. Encouraging field survey that shows large quantity of ears that will be smaller than average / Aug 23. Additional rain damage; crop

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

Lot Records for Field 1 (Zoom in to see details)

GROWER: BSA										Date Planted: 5/31/2016 - 6/01/2016				
FARM LOCATION: Cayo One Estates I					SECTION #: 1a, 1b, 1c		BLOCK #: DK 7088;					SOIL TYPE: Black Loam		
CROP: Corn					VARIETY: Dow 3383; ASG R9000					# OF ACRES: 141+24+24				
LAND PREPARATION					FERTILIZERS					PLANTING				
Discing	Harrowing	Leveling or Land Plane	Raking	Other	PREPLANT	AT PLANTING				Seed-Rate	Condition			
5/1/2016	23-May-16	5/9/2016	4-May-16		See Below	Aporte Pre-M See Below				27,656	Dry & Hot			
5/16/2016														
5/20/2016														
FERTILIZERS					Rain inches			PESTICIDES						
Date	Analysis	Rate/Ac	Ground	Air	#	Date	Quantity	Date	Description	Rate/Ac	Ground	Air	#	
26-May-16	13.3-30.3-13.2-1.8S	330lb	X		1	6/3/2016	0.6	3-Jun-16	Atrazine	1lb	X		3	
31-May-16	Aporte Pre-M	2L	X		2	6/5/2016	1.5	3-Jun-16	Prowl	1L	x		3	
31-May-16	Yermiplex (111 acres)	4L	X		2	6/8/2016	0.5	13-Jun-16	Certero (perimeter only)	161 cc		x	4	
22-Jun-16	46-0-0	100lb		x	6	6/9/2016	0.8	13-Jun-16	Aporte Pre-M	250 cc		x	4	
8-Jul-16	38.5-0-0-7.2S	136lb		x	8	6/12/2016	0.7	13-Jun-16	Damoil	250 cc		x	4	
15-Jul-16	Aporte Pre-M	630 cc		x	9	6/17/2016	1.9	18-Jun-16	Primero	18 cc		x	5	
8-Aug-16	46-0-0	110lb		x	10	6/18/2016	1.3	18-Jun-16	Tordon	150 cc		x	5	
						6/19/2016	3.8	18-Jun-16	Aporte Pre-M	122 cc		x	5	
						6/22/2016	1.0	18-Jun-16	Surf-Ac	3 cc		x	5	
						6/23/2016	0.8	26-Jun-16	Certero	161 cc		x	7	
						6/24/2016	0.7	26-Jun-16	Surf-Ac	2 cc		x	7	
						6/25/2016	0.7	26-Jun-16	Aporte Pre-M	80 cc		x	7	
						6/26/2016	0.8	15-Jul-16	Amistar Top	200 cc		x	9	
						6/27/2016	1.9	23-Sep-16	RoundUp	1.25L		x	11	
						7/3/2016	0.2	23-Sep-16	Aporte Pre-M	121cc		x	11	
						7/4/2016	0.1	23-Sep-16	Heat	19gr		x	11	
						7/6/2016	0.2							
						7/9/2016	0.1							
						7/10/2016	0.3							
						7/6/2016	0.2							
						7/9/2016	0.1							
						7/10/2016	0.3							
						7/12/2016	0.5							
						7/13/2016	0.4							
						7/14/2016	0.1							
						7/15/2016	0.1							
						7/16/2016	0.0							
						7/17/2016	0.1							
						7/18/2016	0.2							
						7/19/2016	0.9							
						7/20/2016	0.4							
						7/23/2016	0.1							
						7/24/2016	1.0							
						7/27/2016	0.0							
						7/28/2016	0.1							
						7/29/2016	0.7							
						7/30/2016	0.1							
						8/1/2016	0.4							
						8/3/2016	1.5							
						8/4/2016	2.4							
						8/13/2016	0.0							
						8/14/2016	1.4							
						8/15/2016	0.0							
						8/16/2016	0.0							
						8/17/2016	0.0							
						8/19/2016	0.2							
						8/20/2016	0.1							
						8/21/2016	0.3							
						8/22/2016	2.4							
						8/23/2016	0.0							
						8/24/2016	0.1							
						8/25/2016	1.0							
						8/26/2016	0.0							
						8/29/2016	0.2							
						8/31/2016	3.5							
						9/1/2016	0.8							
						9/5/2016	1.8							
						9/6/2016	0.1							
						9/7/2016	0.2							
						9/8/2016	0.1							
						9/11/2016	0.1							
						9/12/2016	0.3							
						9/14/2016	0.1							
						9/15/2016	0.0							
						9/16/2016	0.4							
						9/17/2016	0.2							
						9/18/2016	0							
						9/19/2016	0							
						9/20/2016	0.7							
						9/21/2016	0.5							
						9/22/2016	0.3							
						9/23/2016	0.9							
						9/24/2016	0.9							
						9/25/2016	0.9							
						9/26/2016	0.4							
						9/27/2016	0.2							
						9/28/2016	0.0							
						9/29/2016	0.1							
						9/30/2016	0.6							
						10/1/2016	0.2							
						10/2/2016	0.0							
						10/3/2016	0.3							
						Season Total:	46.9							

Belize Sustainable Agriculture, Ltd. Farming Report – October 4, 2016

Lot Records for Field 2 (Zoom in to see details)

GROWER:		BSA		Date Planted:		5/28-31/2016							
FARM LOCATION:		Cayo One Estates I		SECTION #: 2, 2a, 2b		BLOCK #:							
CROP:		Corn		VARIETY:		DeKalb 7088							
						# OF ACRES: 253.16+15.1+15.74							
LAND PREPARATION				FERTILIZERS				PLANTING					
Discing	Harrowing	Leveling or Land Plane	Raking	Other	PREPLANT	AT PLANTING			Seed-Rate	Condition			
5/5/2016	23-May-16	5/12/2016	6-May-16		See Below		Aporte Pre-M See Below			27,656	Dry & Hot		
5/10/2016		5/17/2016											
5/16/2016													
FERTILIZERS					Rain Inches		PESTICIDES						
Date	Analysis	Rate/Ac	Ground	Air	#	Date	Quantity	Date	Description	Rate/Ac	Ground	Air	#
Section 2						6/3/2016	0.6	2-Jun-16	Atrazine	1lb	x		3
20-May-16	13.3-30.3-13.2-1.8S	330lb	X		1	6/5/2016	1.5	2-Jun-16	Prowl	1lb	x		3
28-May-16	Aporte Pre-M	2L	X		2	6/8/2016	0.5	13-Jun-16	Certero (perimeter only)	161 cc		x	4
22-Jun-16	46-0-0	102lb		x	6	6/9/2016	0.8	13-Jun-16	Aporte Pre-M	250 cc		x	4
8-Jul-16	38.5-0-0-7.2S	142.9lb		x	8	6/12/2016	0.7	13-Jun-16	Damoiil	250 cc		x	4
15-Jul-16	Aporte Pre-M	630 cc		x	9	6/17/2016	1.9	18-Jun-16	Primero	18 cc		x	5
8-Aug-16	46-0-0	112.3lb		x	10	6/18/2016	1.3	18-Jun-16	Tordon	150 cc		x	5
						6/19/2016	3.8	18-Jun-16	Aporte Pre-M	122 cc		x	5
						6/22/2016	1.0	18-Jun-16	Surf-Ac	3 cc		x	5
Section 2a,2b						6/23/2016	0.8	26-Jun-16	Certero	161 cc		x	7
20-May-16	13.3-30.3-13.2-1.8S	330lb	X		1	6/24/2016	0.7	26-Jun-16	Surf-Ac	2 cc		x	7
28-May-16	Aporte Pre-M	2L	X		2	6/25/2016	0.7	26-Jun-16	Aporte Pre-M	80 cc		x	7
22-Jun-16	46-0-0	157lb		x	6	6/26/2016	0.8	15-Jul-16	Amistar Top	200 cc		x	9
8-Jul-16	38.5-0-0-7.2S	150lb		x	8	6/27/2016	1.9	23-Sep-16	RoundUp	1.25L		x	11
15-Jul-16	Aporte Pre-M	630 cc		x	9	7/3/2016	0.2	23-Sep-16	Aporte Pre-M	121cc		x	11
8-Aug-16	46-0-0	167lb		x	10	7/4/2016	0.1	23-Sep-16	Heat	19gr		x	11
						7/6/2016	0.2						
						7/9/2016	0.1						
						7/10/2016	0.3						
						7/12/2016	0.5						
						7/13/2016	0.4						
						7/14/2016	0.1						
						7/15/2016	0.1						
						7/16/2016	0.0						
						7/17/2016	0.1						
						7/18/2016	0.2						
						7/19/2016	0.9						
						7/20/2016	0.4						
						7/23/2016	0.1						
						7/24/2016	1.0						
						7/27/2016	0.0						
						7/28/2016	0.1						
						7/29/2016	0.7						
						7/30/2016	0.1						
						8/1/2016	0.4						
						8/3/2016	1.5						
						8/4/2016	2.4						
						8/13/2016	0.0						
						8/14/2016	1.4						
						8/15/2016	0.0						
						8/16/2016	0.0						
						8/17/2016	0.0						
						8/19/2016	0.2						
						8/20/2016	0.1						
						8/21/2016	0.3						
						8/22/2016	2.4						
						8/23/2016	0.0						
						8/24/2016	0.1						
						8/25/2016	1.0						
						8/26/2016	0.0						
						8/29/2016	0.2						
						8/31/2016	3.5						
						9/1/2016	0.8						
						9/5/2016	1.8						
						9/6/2016	0.1						
						9/7/2016	0.2						
						9/8/2016	0.1						
						9/11/2016	0.1						
						9/12/2016	0.3						
						9/14/2016	0.1						
						9/15/2016	0.0						
						9/16/2016	0.4						
						9/17/2016	0.2						
						9/18/2016	0.0						
						9/19/2016	0						
						9/20/2016	0.7						
						9/21/2016	0.5						
						9/22/2016	0.3						
						9/23/2016	0.9						
						9/24/2016	0.9						
						9/25/2016	0.9						
						9/26/2016	0.4						
						9/27/2016	0.2						
						9/28/2016	0.0						
						9/29/2016	0.1						
						9/30/2016	0.6						
						10/1/2016	0.2						
						10/2/2016	0.0						
						10/3/2016	0.3						
						Season Total	46.4						