



2016 Maple Business Benchmark

FBRR026 - 5/18 (Revised Version) Mark Cannella, Farm Business Management Specialist



Photo Credit: Mark Isselhardt

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Revised Version

This version has been updated 5/21/18 and it includes corrections to Table 6-10 (Variable Cost Total) and Table 12-21 (Data Correction for 15,000+tap subgroup)



2016 Maple Business Benchmark , page 2

FBRR026 - 2/18

Acknowledgements

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Contents

Introduction.....	3
Terms and Definitions	3
Participant Overview	5
Land Use	6
Productivity	6
Investments.....	7
Expenses.....	8
Cost of Production, Ratios and Comparisons.....	12
Top Performers	14
Market Channel.....	15

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2016 Maple Business Benchmark , page 3

FBRR026 - 2/18

Introduction

Maple producers continue to evaluate the feasibility of maintaining or expanding operations as market prices decline. At the time of this report (January 2018) market prices have dropped to near \$2.00 per pound for bulk syrup and organic premiums have declined modestly. The current US bulk market prices have decoupled from an exact calculation of the Federation of Quebec Maple Syrup Producers (FPAQ) pricing levels adjusted for US-Canadian currency exchange rates. Several public presentations from industry leaders at VT Maple Conferences¹ have confirmed that markets continue to grow but that there is short term surplus syrup inventory following strong 2016 and 2017 crop years. This market situation continues to prompt dialogue about the industry outlook, policy considerations, product innovation, producer driven initiatives and the health of individual businesses.

The 2016 Maple Business Benchmark is the fourth year of financial record analysis for a small group of commercial syrup producers. The University of Vermont Extension worked with seventeen maple producers to complete financial analysis of their maple enterprise but only eleven financial records were deemed suitable and accurate enough for inclusion in the 2016 group analysis. Participants each received a detailed financial summary of their business that included information on sales, expenses, investments and profitability. The project team acknowledge the challenges to present any sweeping conclusions from this small group. This report shows a wide range of figures due to the small group size and diversity of operations participating in 2016. The subgroup of participants with over 15,000 taps in this report, is very small with only two usable business records.

The 2016 study group is a small sample of the entire Vermont maple industry. The methods for this project and our reported observations can, however, compel maple business managers to consider the relevance for their particular business situations. Maple managers can use the cost analysis methods presented here to analyze their own business and then assess the changes in their individual performance from year to year.

Terms and Definitions

Cost of Production (COP): Calculated by adding annual variable operating costs, fixed costs, accrued expenses, depreciation and value of unpaid labor. Certain fixed expenses, capital assets and depreciation have been pro-rated to reflect the allocation of this expense to the “maple enterprise” versus other business activities. Depreciation cost is obtained by dividing the purchase price of capital assets by an average life span. No consideration is given to depreciation taken for tax purposes or estimated salvage values in this report.

¹ VT Maple Conference: Hyde Park, VT January 27, 2018. Industry Panel Discussion.



2016 Maple Business Benchmark , page 4

FBRR026 - 2/18

The “cost of production” section of this report includes three different cost of production calculations. All cost of production calculations exclude any payments made towards real estate ownership. The “full economic cost of production” includes both owner draws and any residual unpaid owner labor and management. Unpaid labor is valued at \$22.00 per hour.

- COP from Operations: Includes variable costs, fixed costs (excluding loans), capital expenses and owner compensation.
- COP with Depreciation: Includes COP from Operations and depreciation. It does not include owner draws or unpaid labor/management.
- Full Economic COP: Includes COP with Depreciation, owner draws and the value of unpaid labor/management.

Bulk Producers: These producers sell 90% or more of their gross sales to bulk buyers.

Intermediate Assets: Equipment, machinery and improvements that have a useful life of more than a one year. Long term real estate assets were not included in this analysis.

Investment (Asset @ Cost): Investment refers to the cash value for the purchase of intermediate assets in use by the business. Participants reported the cash cost at the time of purchase. In some instances a Fair Market Value estimate was used to value assets and/or calculate depreciation when cost basis records were not available.

Long Term Assets: Long term assets include buildings and improvements with a lifespan greater than 20 years. Real estate values were not included in this project (nor was cash payments or debt service related to real estate).

Median: The mid-point of a range of data with an equal number of data points below and above the median.

Net Returns to Real Estate: Accrual adjusted income, less operating expenses, less depreciation, less value of owner unpaid labor. Principal and interest on real estate payments are not included.

Production-Based Income: Sales, plus inventory adjustments, plus accounts payable/receivable adjustments at the end of the year. Inventory valuations were based on expected sale prices given the product form (package size) at the end of the year. Inventory of bulk syrup intended for re-packing to retail was valued at bulk prices. Retail packaged inventory was valued at conservative retail prices and/or discounted.

Sales: Cash receipts received from January 1st – December 31st. For certain indicators “production based income” replaces sales.



2016 Maple Business Benchmark , page 5

FBRR026 - 2/18

Top Profit Group: This is the group of producers that demonstrated a Return on Assets that is equal to or above the group average. Return on Assets is calculated as “net farm income ÷ intermediate assets.”

Unpaid Owner Labor: Owners estimated the number of hours contributed to essential operating activities for the following categories: sugar bush, sugarhouse time, packing/canning, sales, marketing, distribution and office time. Each hour was valued at \$22.00 per hour.

Variable and Fixed Costs: These are the costs associated with annual operation of the business. These operating expenses include interest payment associated with debt service but not the principal portion. The following “capital activity” items are not included in our variable or fixed cost categories: principal portion of debt payments (cash expenses), capital expenses (cash expenses), depreciation (non-cash) and value of unpaid labor (non-cash).

Wholesale/Retail: Producers that sell less than 90% of total sales to bulk buyers. Other sales channels include a mix of business to business and direct sales to customers.

Participant Overview

Seventeen producers completed financial analysis for the 2016 calendar year and eleven usable business records were analyzed for this report. The section below describes key features of the business owners and their operations. The number of total respondents for each topic varies based on the number of completed management questionnaires.

Tap Number

- 2,600 - 4,999 taps : 5 producers
- 5,000 - 8,499 taps : 3 producers
- 8,500 - 14,999 taps : 1 producers
- 15,000 taps and over : 2 producers

Reverse Osmosis

- 90% of participants used reverse osmosis (RO) technology. Three participants have used RO technology for more than 20 years.

Fuel

- 5 producers use oil
- 6 producers use wood, wood chips or wood pellets



2016 Maple Business Benchmark , page 6

FBRR026 - 2/18

Market Channels

- 4 producers are categorized as “Bulk” (90% or more of sales from Bulk Sales).
- 7 producers are categorized as “Retail/Wholesale” mix.
- This group included certified organic producers.

Land Use

Table 1: Financial Measures Per Acre

	Range		Average	Median
	Low	High		
Taps Per Acre	40	98	57	52
Gallons Syrup Per Acre	18	41	30	28
Pounds of Syrup Per Acre	200	452	332	317
Production Based Income Per Acre	\$709	\$1,518	\$1,032	\$ 921
Net Returns Per Acre	(\$124)	\$402	\$155	\$ 211

Productivity

Table 2: Productivity Per Tap

	Range		Average	Median
	Low	High		
Taps (#)	2,650	17,000	7,391	6,000
Gallons Per Tap	0.30	0.66	0.51	0.53
Pounds Per Tap²	3.3	7.3	5.6	5.9

The USDA National Agricultural Statistics Service reported the average yield for Vermont in 2016 is 0.41 gallons of syrup per tap³ (4.6 pounds per tap).

² The conversion factor of 11.138 lbs. = 1 gallon syrup was used when actual records were not available.

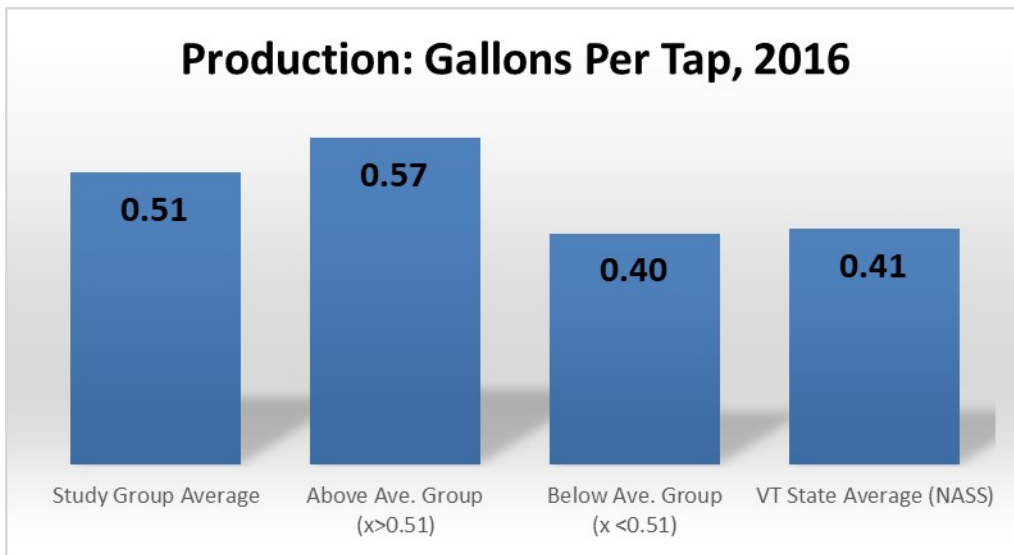
³ Northeast Maple Syrup Production, available online at: https://www.nass.usda.gov/Statistics_by_State/New_England_includes/Publications/Current_News_Release/2016/Maple.pdf



2016 Maple Business Benchmark , page 7

FBRR026 - 2/18

Figure 1: Production Yields in 2016



Investments

Table 3: Investment Per Tap (cost basis valuation, see definitions)

	Range		Average	Median
	Low	High		
Asset @ Cost Per Tap	\$ 18	\$ 74	\$ 50	\$ 53

Table 4: Investment Per Tap for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
2,600-4,999	\$ 18	\$ 68	\$ 54	\$ 61
5,000 – 8,499	\$ 26	\$ 74	\$ 50	\$ 49
8,500 – 14,999	\$ 38	\$ 38	\$ 38	n/a ⁴
15,000 +	\$ 44	\$ 55	\$ 50	n/a

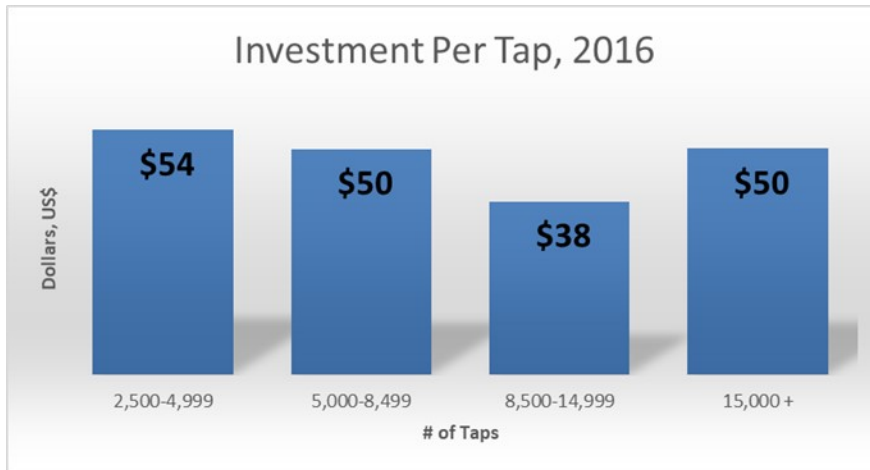
⁴ Median is not reported for tap size groups with 2 or less data points



2016 Maple Business Benchmark , page 8

FBRR026 - 2/18

Figure 2: Investment Level at Different Scales



The average yield for the entire group is 0.51 gallons per tap or 5.6 pounds per tap in 2016. The “Above Average” group in Table 5 include all participants with over 0.51 gallons per tap. In previous years there was an observed difference of investment level with above average yield producers making a larger investment. This was not observed in 2017.

Table 5: Investment Levels Based on Yield

	Average Investment Value
Above Average Yield Producers	\$ 51 Per Tap
Below Average Yield Producers	\$ 50 Per Tap

Depreciation

The aging and incremental loss of value to business assets (depreciation) is a significant expense for which maple producers must monitor and plan. For this cost analysis the “tax based depreciation” is not utilized because this often overstates or accelerates the depreciation expense as allowed by IRS tax code. For this study business assets are depreciated according to the straight-line method using purchase price and standard lifespans for each item.



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2016 Maple Business Benchmark , page 9

FBRR026 - 2/18

In 2016 depreciation ranged from a low of 10% to a high of 42% of production-based income (See Table 9). The average depreciation was 18% of production-based income (ex. Using the 18% average, a business earning \$100,000 per year would have a calculated depreciation expense equal to ~\$18,000 per year).

Table 6: Key Expenses Per Gallon (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)⁵	\$0.00	\$1.32	\$0.62	\$0.58
Labor (Paid)	\$0.00	\$10.32	\$3.65	\$3.39
All Labor (including unpaid Labor)⁶	\$3.50	\$22.52	\$11.01	\$10.75
Electric	\$0.00	\$1.35	\$0.74	\$0.70
Supplies	\$0.22	\$3.55	\$1.56	\$1.53
Variable Cost Total	\$4.03	\$17.26	\$11.39	\$11.08
Fixed Cost Total	\$1.36	\$9.10	\$3.31	\$2.58
Depreciation	\$2.77	\$10.32	\$5.68	\$5.47

Table 7: Key expenses Per Pound (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)⁷	\$0.00	\$0.12	\$0.05	\$0.05
Labor (Paid)	\$0.00	\$0.93	\$0.33	\$0.30
All Labor (including unpaid Labor)	\$0.31	\$2.02	\$0.99	\$0.97
Electric	\$ 0.00	\$0.12	\$0.07	\$0.06
Supplies	\$0.02	\$0.32	\$0.14	\$0.14

(Table 7 continued on next page)

⁵ Operators using harvested cordwood or chips report no cash expense for fuel, these operations have increased labor or equipment related expenses related to firewood production. Any data points for \$0 fuel expense has been removed from average or median cost to show a usable metric for those that do manage a direct expense for fuel purchase.

⁶ The value of unpaid labor has been assigned based on owner hours worked multiplied by \$22 per hour value

⁷ See Footnote #5



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2016 Maple Business Benchmark , page 10

FBRR026 - 2/18

(Table 7 continued...)

	Low	High	Average	Median
Variable Cost Total	\$0.36	\$1.57	\$1.02	\$1.21
Fixed Cost Total	\$0.12	\$0.82	\$0.30	\$0.23
Depreciation	\$0.25	\$0.93	\$0.51	\$0.49

Table 8: Key Expenses Per Tap (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)⁸	\$ 0.00	\$0.67	\$0.20	\$0.09
Labor (Paid)	\$ 0.00	\$7.15	\$1.93	\$1.20
All Labor (including unpaid Labor)	\$3.05	\$12.05	\$6.09	\$5.78
Electric	\$ 0.00	\$0.99	\$0.39	\$0.35
Supplies	\$0.12	\$1.86	\$0.90	\$0.89
Variable Cost Total	\$1.52	\$18.27	\$7.02	\$7.10
Fixed Cost Total	\$0.71	\$4.41	\$1.87	\$1.30
Depreciation	\$1.48	\$4.93	\$3.20	\$3.10

Table 9: Key Expenses Expressed as a Percent of Production-Based Income

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)⁹	0%	5%	2%	2%
Labor (Paid)	0%	35%	11%	9%
All Labor (including unpaid Labor)	12%	63%	33%	32%
Electric	0%	5%	2%	2%
Supplies	1%	9%	5%	4%

(Table 9 continued on next page)

⁸ See Footnote #5

⁹ See Footnote #5



2016 Maple Business Benchmark , page 11

FBRR026 - 2/18

(Table 9 continued...)

	Low	High	Average	Median
Variable Cost Total	16%	62%	34%	32%
Fixed Cost Total	3%	32%	10%	9%
Depreciation	8%	42%	18%	17%

Table 10: Bulk Producers only, Key Expenses Per Pound

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)¹⁰	\$0.00	\$0.12	\$0.09	\$0.09
Labor (Paid)	\$0.00	\$0.31	\$0.19	\$0.21
All Labor (including unpaid Labor)	\$0.31	\$0.99	\$0.70	\$0.75
Electric	\$0.00	\$0.12	\$0.09	\$0.09
Supplies	\$0.02	\$0.10	\$0.06	\$0.07
Variable Cost Total	\$0.36	\$1.57	\$0.78	\$0.59
Fixed Cost Total	\$0.20	\$0.25	\$0.22	\$0.22
Depreciation	\$0.35	\$0.93	\$0.55	\$0.47

Cost of Production, Ratios and Comparisons

Table 11: Cost of Production from Operations (see “Terms and Definitions”)

	Range		Average	Median
	Low	High		
COP (Operations) Per Tap	\$2.57	\$20.66	\$8.90	\$7.97
COP (Operations) Per Gallon	\$6.81	\$22.98	\$14.70	\$16.12
COP (Operations) Per Pound	\$0.61	\$2.06	\$1.32	\$1.45

¹⁰ See Footnote #5



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2016 Maple Business Benchmark , page 12

FBRR026 - 2/18

Table 12: Cost of Production with Depreciation

	Range		Average	Median
	Low	High		
COP with Depreciation Per Tap	\$6.33	\$25.29	\$12.10	\$10.64
COP with Depreciation Per Gallon	\$11.44	\$29.54	\$20.38	\$20.25
COP with Depreciation Per Pound	\$1.03	\$2.65	\$1.83	\$1.82

Table 13: Full Economic Cost of Production

	Range		Average	Median
	Low	High		
Full Economic Cost of Production (COP) Per Tap	\$10.02	\$25.59	\$16.15	\$14.91
Full Economic Cost of Production (COP) Per Gallon	\$18.08	\$40.54	\$28.20	\$26.03
Full Economic Cost of Production (COP) Per Pound	\$1.78	\$3.64	\$2.53	\$2.34

Table 14: Ratios for All Producers

	Range		Average	Median
	Low	High		
Production Based Income ÷ Investment	15%	108%	46%	32%
Net Returns to Real Estate ÷ Investment	-2%	25%	8%	7%
Unpaid Labor ÷ Production Based Income	0%	53%	24%	25%

Table 15: Comparisons of Ratios for 2014 - 2016

	Averages		
	2014	2015	2016
Production Based Income ÷ Investment	46%	37%	46%
Net Returns to Real Estate ÷ Investment	3%	0%	8%
Unpaid Labor ÷ Production Based Income	19%	29%	24%
Depreciation ÷ Production Based Income	20%	24%	18%



2016 Maple Business Benchmark , page 13

FBRR026 - 2/18

The study group has shifted from 2014 to 2016. Certain individuals have entered the project while others are no longer participating. A very important shift is also the transformation of participant’s production and marketing plans. By 2016, certain producers have a) expanded taps, b) completed organic certification and c) pursued wholesale and retail market activities in anticipation of declining bulk market prices which would threaten profitability.

Table 16: Net Returns Divided by Investment for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
2,600 - 4,999	-2%	9%	3%	3%
5,000 - 8,499	5%	25%	13%	10%
8,500 - 14,999	22%	22%	22%	n/a
15,000 +	7%	7%	7%	n/a

Table 17: Full Economic Cost of Production Per Pound for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
2,600 - 4,999	\$2.34	\$3.64	\$2.87	\$2.76
5,000 - 8,499	\$2.00	\$3.35	\$2.48	\$2.09
8,500 - 14,999	\$2.09	\$2.09	\$2.09	n/a
15,000 +	\$1.78	\$2.19	\$1.99	\$1.99

Top Performers

The following tables show the financial performance for producers that achieved above average profits for this study group. Profitability was measured using “Net Returns ÷ Investment.” The average profit level for the entire group in 2016 was 8% and the Top Profit Group included participants that demonstrated 8% - 25% “Net Returns ÷ Investment.”



2016 Maple Business Benchmark , page 14

FBRR026 - 2/18

Table 18: Average Full Economic Cost of Production Top Profit vs. Full Group (Per Pound)

	Top Profit Group	Full Group
Taps	<i>Per Pound</i>	<i>Per Pound</i>
2,600 - 4,999	\$3.64	\$2.87
5,000 - 8,499	\$2.72	\$2.48
8,500 - 14,999	\$2.09	\$2.09
15,000 +	none	\$1.99

Table 19: Average Full Economic Cost of Production Top Profit vs. Full Group (Per Gallon)

	Top Profit Group	Full Group
Taps	<i>Per Gallon</i>	<i>Per Gallon</i>
2,600 - 4,999	\$40.50	\$31.97
5,000 - 8,499	\$30.30	\$27.62
8,500 - 14,999	\$23.28	\$23.31
15,000 +	none	\$22.13

Table 20: Average Full Economic Cost of Production Top Profit vs. Full Group (Per Tap)

	Top Profit Group	Full Group
Taps	<i>Per Tap</i>	<i>Per Tap</i>
2,600 - 4,999	\$23.67	\$17.12
5,000 - 8,499	\$14.81	\$14.74
8,500 - 14,999	\$12.25	\$12.25
15,000 +	none	\$17.80*

* Table 20 includes the presence of large sap purchases in the 15,000+ tap subgroup

Cost of Production can be measured in different ways. The per gallon or per pound unit of measure will relate costs to the yield produced (Table 18-19) and provide easy reference back to market prices. The per-tap unit of measure (Table 20) relates costs to the maple resource being managed, regardless of yield. This provides a stable calculation for cost management that can be compared year to year.

In certain cases the Top Profit Group will show higher costs than the Full Group. This demonstrates that the Top Profit Producers are not necessarily the lowest cost producers. They may incur higher expenses but they are able to offset that expense through the combination of higher yields and higher market prices to generate more total gross income.



2016 Maple Business Benchmark , page 15

FBR026 - 2/18

Market Channel

Table 21: Full Economic Cost of Production and Marketing Channel

Market Channel	Range		Average
	Low	High	
Bulk	\$1.78 per lb.	\$2.52 per lb.	\$2.15 per lb.
Retail/Wholesale	\$ 2.00 per lb. \$ 22.25 per gal.	\$ 3.64 per lb. \$ 40.54 per gal.	\$ 2.75 per lb. \$ 30.65 per gal.

For more information on Maple Benchmark go to the UVM Extension Farm Viability website:

<http://blog.uvm.edu/farmvia/>