



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark

FBRR024 - 10/17 Mark Cannella, Farm Business Management Specialist



Photo Credit: Chris Lindgren, Brookside Sugarhouse in Westminster, VT

Mark Cannella, University of Vermont Extension
Christopher Lindgren, University of Vermont Extension
Betsy Miller, University of Vermont Extension



2015 Maple Business Benchmark , page 2

FBRR024 - 10/17

Acknowledgements

Special thanks to the maple syrup and sap producers that have shared their financial records and experience to support this project.

Contents

Introduction	3
Terms and Definitions	3
Participant Overview	5
Summary	6
Land Use	6
Productivity	6
Investments.....	7
Expenses.....	7
Cost of Production, Ratios and Comparisons.....	12

*Funding provided by the University of Vermont, Working Lands Enterprise Board,
Vermont Agency of Agriculture, Food and Markets and
United States Department of Agriculture Risk Management Agency*





UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 3

FBRR024 - 10/17

Introduction

The 2015 Maple Business Benchmark is the third year of financial analysis for a small group of commercial syrup producers. The University of Vermont Extension worked with 14 maple producers to complete financial analysis of their maple enterprise. Participants each received a detailed financial summary of their business that included information on sales, expenses, investments and profitability. The participants represent a small sample of the entire Vermont maple industry but the findings can compel any manager to consider the methods and results of financial analysis for their particular business situations. This report will show a wide range of figures due to the small group size and diversity of operations participating in 2015.

Terms and Definitions

Accrual Adjusted Production Income: Sales, plus inventory adjustments, plus accounts payable and accounts 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.

Average: a number expressing a central value in a set of data which is calculated by dividing the sum of values in a data set by the number of data points.

Cost of Production (COP): Calculated by adding annual variable costs, fixed costs, accrued expenses, depreciation and value of unpaid labor. Certain fixed expenses and depreciation of capital assets have been prorated 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.

The “cost of production” section of this report includes 3 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 and fixed costs
- 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” plus owner draws and/or the value of unpaid labor/management.

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



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 4

FBR024 - 10/17

Fixed Costs: Costs incurred throughout the year that are assumed to be stable regardless of production volumes. Fixed Costs 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). (Note: Depreciation is included as a Fixed Cost in break-even calculations)

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.

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 Farm Income: Accrual adjusted income, less operating expenses, less depreciation, less owner draws and any unpaid labor/management. Principal and interest on real estate payments are not included.

Production-Based Income: Annual sales plus accrual income adjustments.

Sales: Cash receipts received from January 1st – December 31st.

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” (this calculation does not include long term real estate asset values)

Unit Conversions: 1 gallon of syrup = 11.138 pounds

Unpaid Owner Labor: Owners estimated the number of hours contributed to operating activities for the following categories: sugar bush, sugarhouse time, packing/canning, sales, marketing, distribution and office time. Each hour was valued at \$22 per hour.

Variable Costs: These are the costs associated with annual operation of the business and assumed to go up or down in relation to the amount of production.



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 5

FBRR024 - 10/17

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

Fourteen producers completed financial analysis for the 2015 calendar year. 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 : 6 producers
- 5,000 - 8,499 taps : 4 producers
- 8,500 - 14,999 taps : 2 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

- 7 producers use oil.
- 7 producers use wood, wood chips or wood pellets.

Market Channels

- 8 producers are categorized as “Bulk” (90% or more of sales from Bulk Sales).
- 6 producers are categorized as “Retail/Wholesale” mix.



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 6

FBRR024 - 10/17

Summary

This report is based on a small group of producers and many financial metrics show a large range of values. A small sample size and the uniqueness of independent agricultural businesses present obvious limitations to sweeping conclusions from the data presented.

Maple producers continue to evaluate the feasibility of maintaining operations as market prices decline. Table 15 in this report provides a comparison of whole business ratios from 2014 to 2015. All ratios show shrinking profit margins in 2015 indicating a more challenging business environment. The production-based income ratio and the net returns ratios have decreased in 2015. The cost ratios for unpaid labor and depreciation have both increased for 2015.

The following pages include specific financial measures for participating producers and sub groups based on scale and market channels.

Land Use

Table 1: Financial Measures Per Acre

	Range		Average	Median
	Low	High		
Accrual Adjusted Income Per Acre	\$ 465	\$ 1,368	\$ 886	\$ 846
Net Farm Income Per Acre	- \$ 595	\$ 442	- \$19	\$ 32
Taps Per Acre	40	112	62	55
Gallons Syrup Per Acre	15	46	26	27

Productivity

Table 2: Productivity Per Tap

	Range		Average	Median
	Low	High		
Taps (#)	2,650	16,000	7,909	6,600
Gallons Per Tap	0.22	0.54	0.40	0.40
Pounds Per Tap¹	2.4	6	4.4	4.5

¹ Unit conversion factor: 11.138 lbs. = 1 gallon syrup



2015 Maple Business Benchmark , page 7

FBR024 - 10/17

The USDA National Agricultural Statistics Service reported the average yield for Vermont in 2015 is 0.31 gallons of syrup per tap² (3.5 pounds per tap).

Investments

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

	Range			
	Low	High	Average	Median
Asset @ Cost Per Tap	\$ 18	\$ 74	\$ 48	\$ 50

Table 4: Investment Per Tap for Tap Size Groups

Taps	Range			
	Low	High	Average	Median
2,600-4,999	\$ 18	\$ 68	\$ 54	\$ 59
5,000 – 8,499	\$ 23	\$ 74	\$ 45	\$ 41
8,500 – 14,999	\$ 33	\$ 56	\$ 44	n/a ³
15,000 +	\$ 30	\$ 47	\$ 39	n/a

Table 5: Investment Levels Based on Yield

	Average Investment Value
Above Average Yield Producers	\$51 Per Tap
Below Average Yield Producers	\$43 Per Tap

The average yield for the entire group is 0.40 gallons per tap or 4.4 pounds per tap in 2015. The “Above Average” group in Table 5 include all participants with over 0.40 gallons per tap.

² https://www.nass.usda.gov/Statistics_by_State/New_England_includes/Publications/Current_News_Release/2017/2017_Maple_Syrup.pdf

³ Median is not reported for tap size groups with 2 or less data points



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 8

FBRR024 - 10/17

Expenses

There are producers in this report that purchase sap or syrup. When these purchases are significant, the variable costs per tap will appear higher than the actual costs to maintain their own taps. In some cases the cost per gallon or cost per pound may appear high depending on the impact of the price of purchased syrup. The high-end range for variable costs is driven by operations that purchased significant amounts of finished syrup for resale. Producers that only produce syrup from their own woods will expect to incur lower costs.

Understanding Variable and Fixed Cost Totals

Table 6 – Table 10 report a summary of key expenses followed by total variable and total fixed costs. The key expenses listed in the top of Table 6-Table 10 will not add to the total fixed or variable costs (participating business owners have a variety of accounting categories that are not all listed in the “Key Expenses” summary). These tables show a category for “Labor (paid)” and “All Labor (including unpaid labor)” to show the difference between cash based expenses and the full cost of owner labor. The “variable cost total” and the “fixed cost total” do not include the value of unpaid labor⁴.

Depreciation

The aging and incremental loss of value to business assets (depreciation) is a significant expense that maple producers must monitor. 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.

In 2015 depreciation ranged from low of 10% to a high of 60% of production-based income (See Table 9). The average depreciation was 24% of production-based income. (ex. A business earning \$100,000 per year would have a calculated depreciation expense equal to ~\$24,000 per year).

⁴ Note: If one were to sum variable cost+ fixed cost + depreciation from the tables in this section it will add up to the “Cost of Production with Depreciation” in Table 12 (with minor rounding discrepancies).



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 9

FBR024 - 10/17

Table 6: Key Expenses Per Gallon (All Producers)

	Range			
	Low	High	Average	Median
Fuel (Evaporator Only)⁵	\$0.30	\$2.93	\$1.25	\$1.24
Labor (Paid)	\$ 0	\$18.72	\$4.03	\$2.23
All Labor (including unpaid Labor)⁶	\$6.84	\$26.73	\$13.88	\$14.43
Electric	\$ 0	\$1.79	\$0.83	\$0.81
Supplies	\$ 0	\$14.24	\$2.71	\$1.68
Variable Cost Total	\$3.45	\$31.45	\$13.14	\$9.64
Fixed Cost Total	\$1.32	\$22.56	\$6.89	\$3.91
Depreciation	\$3.55	\$19.78	\$7.52	\$6.20

Table 7: Key expenses Per Pound (All Producers)

	Range			
	Low	High	Average	Median
Fuel (Evaporator Only)⁷	\$0.03	\$0.26	\$0.11	\$0.11
Labor (Paid)	\$ 0	\$1.68	\$0.35	\$0.20
All Labor (including unpaid Labor)	\$0.15	\$2.40	\$1.19	\$1.29
Electric	\$ 0	\$0.16	\$0.08	\$0.07
Supplies	\$ 0	\$1.28	\$0.25	\$0.15
Variable Cost Total	\$0.31	\$2.82	\$1.19	\$0.96
Fixed Cost Total	\$0.12	\$2.02	\$0.62	\$0.35
Depreciation	\$0.32	\$1.77	\$0.69	\$0.64

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 this group analysis. The "average" column shows average cost for the subgroup that did purchase evaporator fuel.

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

⁷ See Footnote #5



2015 Maple Business Benchmark , page 10

FBRR024 - 10/17

Figure 1: Average Key Expenses as a Percentage of Total Costs

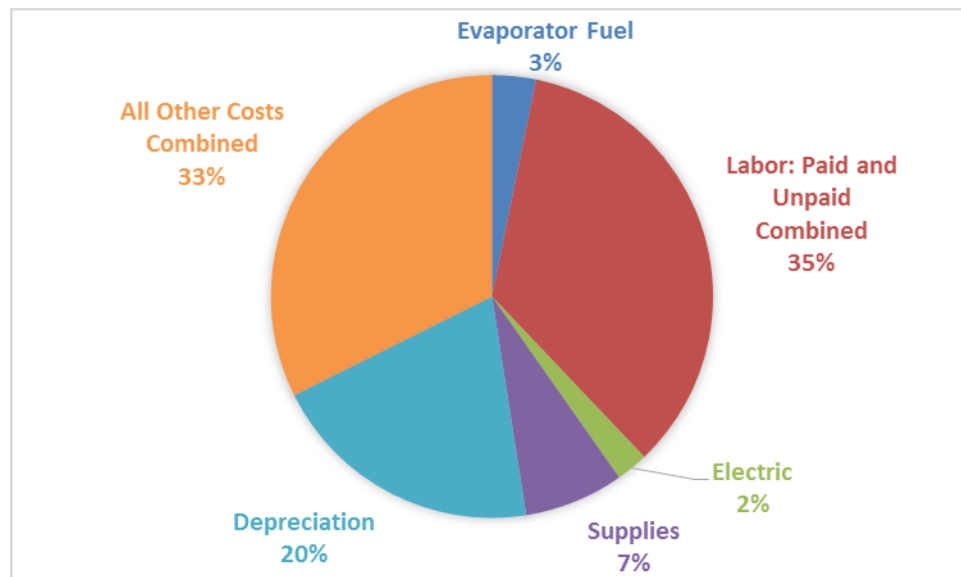


Table 8: Key Expenses Per Tap (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only)⁸	\$0.13	\$1.55	\$0.58	\$0.56
Labor (Paid)	\$ 0	\$6.99	\$1.53	\$0.90
All Labor (including un-paid Labor)	\$0.98	\$11.16	\$5.31	\$5.06
Electric	\$ 0	\$0.65	\$0.35	\$0.34
Supplies	\$ 0	\$3.47	\$1.00	\$0.75
Variable Cost Total	\$1.78	\$12.89	\$5.25	\$4.77
Fixed Cost Total	\$0.55	\$8.42	\$2.69	\$1.74
Depreciation	\$1.48	\$5.07	\$3.09	\$3.08

⁸ See Footnote #5



2015 Maple Business Benchmark , page 11

FBRR024 - 10/17

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

	Range			
	Low	High	Average	Median
Fuel (Evaporator Only)⁹	1%	6%	3%	4%
Labor (Paid)	0%	44%	10%	6%
All Labor (including un-paid Labor)	6%	69%	39%	34%
Electric	0%	4%	3%	3%
Supplies	0%	36%	8%	5%
Variable Cost Total	12%	79%	38%	38%
Fixed Cost Total	3%	53%	20%	11%
Depreciation	9%	63%	24%	22%

Table 10: Bulk Producers Only, Key Expenses Per Pound

	Range			
	Low	High	Average	Median
Fuel (Evaporator Only)¹⁰	\$0.11	\$0.12	\$0.11	\$0.11
Labor (Paid)	\$ 0	\$1.17	\$0.22	\$0.07
All Labor (including un-paid Labor)	\$0.15	\$1.67	\$1.05	\$1.08
Electric	\$ 0	\$0.16	\$0.08	\$0.08
Supplies	\$ 0	\$1.28	\$0.25	\$0.14
Variable Cost Total	\$0.34	\$2.82	\$1.17	\$0.96
Fixed Cost Total	\$0.23	\$1.76	\$0.60	\$0.38
Depreciation	\$0.36	\$1.77	\$0.83	\$0.77

⁹ See Footnote #5

¹⁰ See Footnote #5



2015 Maple Business Benchmark , page 12

FBRR024 - 10/17

Cost of Production, Ratios and Comparisons

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

	Range			
	Low	High	Average	Median
COP (Operations) Per Tap	\$3.09	\$15.02	\$7.76	\$7.28
COP (Operations) Per Gallon	\$6.61	\$51.08	\$19.88	\$15.59
COP (Operations) Per Pound	\$0.59	\$4.59	\$1.78	\$1.40

Table 12: Cost of Production with Depreciation

	Range			
	Low	High	Average	Median
COP with Depreciation Per Tap	\$5.97	\$19.21	\$10.84	\$10.15
COP with Depreciation Per Gallon	\$15.15	\$61.21	\$27.59	\$21.08
COP with Depreciation Per Pound	\$1.36	\$5.50	\$2.48	\$1.89

Table 13: Full Economic Cost of Production

	Range			
	Low	High	Average	Median
Full Economic Cost of Production (COP) Per Tap	\$9.79	\$25.15	\$15.12	\$14.62
Full Economic Cost of Production (COP) Per Gallon	\$20.16	\$65.32	\$38.15	\$38.27
Full Economic Cost of Production (COP) Per Pound	\$1.81	\$5.86	\$3.43	\$3.44

Table 14: Ratios for All Producers

	Range			
	Low	High	Average	Median
Production Based Income ÷ Investment	12%	92%	37%	30%
Net Farm Income¹¹ ÷ Investment	-16%	22%	0%	1%
Unpaid Labor ÷ Production Based Income	0%	63%	29%	32%
Depreciation ÷ Production Based Income	9%	63%	24%	22%

¹¹ Net Farm Income does not include real estate acquisition costs in this study.



UNIVERSITY OF
VERMONT

EXTENSION

CULTIVATING HEALTHY COMMUNITIES

2015 Maple Business Benchmark , page 13

FBRR024 - 10/17

Table 15: Comparisons of Ratios for 2014 and 2015

	Averages	
	2014	2015
Production Based Income ÷ Investment	46%	37%
Net Farm Income ÷ Investment	3%	0%
Unpaid Labor ÷ Production Based Income¹²	19%	29%
Depreciation ÷ Production Based Income	20%	24%

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

Taps	Range		Average	Median
	Low	High		
2,600 - 4,999	-13%	8%	0%	5%
5,000 - 8,499	-16%	22%	1%	-1%
8,500 - 14,999	3%	3%	3%	n/a
15,000 +	-14%	6%	-3%	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	\$1.95	\$5.86	\$3.64	\$3.80
5,000 - 8,499	\$1.81	\$4.23	\$3.14	\$3.26
8,500 - 14,999	\$2.35	\$5.55	\$3.95	n/a
15,000 +	\$2.34	\$3.29	\$2.82	n/a

¹² The 2014 study used \$18 per hour as the value of unpaid labor. The 2015 study increased value to \$22 per hour.



2015 Maple Business Benchmark , page 14

FBRR024 - 10/17

Top Performers

The following tables show the financial performance for producers that achieved above average profits for this study group. The average profit level for the entire group was Return on Intermediate Assets (ROA) of 0%.

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

	Top Profit Group	Full Group
Taps	Per Pound	Per Pound
2,600 - 4,999	\$2.80	\$3.64
5,000 - 8,499	\$2.82	\$3.14
8,500 - 14,999	\$2.35	\$3.95
15,000 +	\$2.82	\$2.82

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

	Top Profit Group	Full Group
Taps	Per Gallon	Per Gallon
2,600 - 4,999	\$31.20	\$40.58
5,000 - 8,499	\$31.40	\$34.97
8,500 - 14,999	\$26.20	\$44.01
15,000 +	\$31.40	\$31.37

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

	Top Profit Group	Full Group
Taps	Per Tap	Per Tap
2,600 - 4,999	\$ 16.40	\$16.26
5,000 - 8,499	\$ 12.81	\$14.04
8,500 - 14,999	\$ 15.48	\$15.27
15,000 +	\$ 13.73	\$13.73



2015 Maple Business Benchmark , page 15

FBR024 - 10/17

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

Market Channel

Table 18: Full Economic Cost of Production and Marketing Channel

	Range		
Market Channel	Low	High	Average
Bulk	\$ 2.16 per lb. \$ 24 per gal.	\$ 5.86 per lb. \$ 65 per gal.	\$ 3.60 per lb. \$40 per gal.
Retail/ Wholesale	\$ 1.81 per lb. \$ 20 per gal.	\$ 4.28 per lb. \$ 48 per gal.	\$ 3.20 per lb. \$ 36 per gal.

The information in Table 18 demonstrates that an existing business marketing strategy may not always follow the presumed alignment with higher or lower cost production. In the table above one observes that “retail/ wholesale” participants in this study have lower cost of production. It is important to note that over the past three years of this project, certain participants have shifted their market strategy away from bulk markets. These producers still maintain low cost of production systems as they pursue a new market channel mix.

For more information go to the Maple Business Benchmark page at the UVM Extension Agricultural Business website:

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