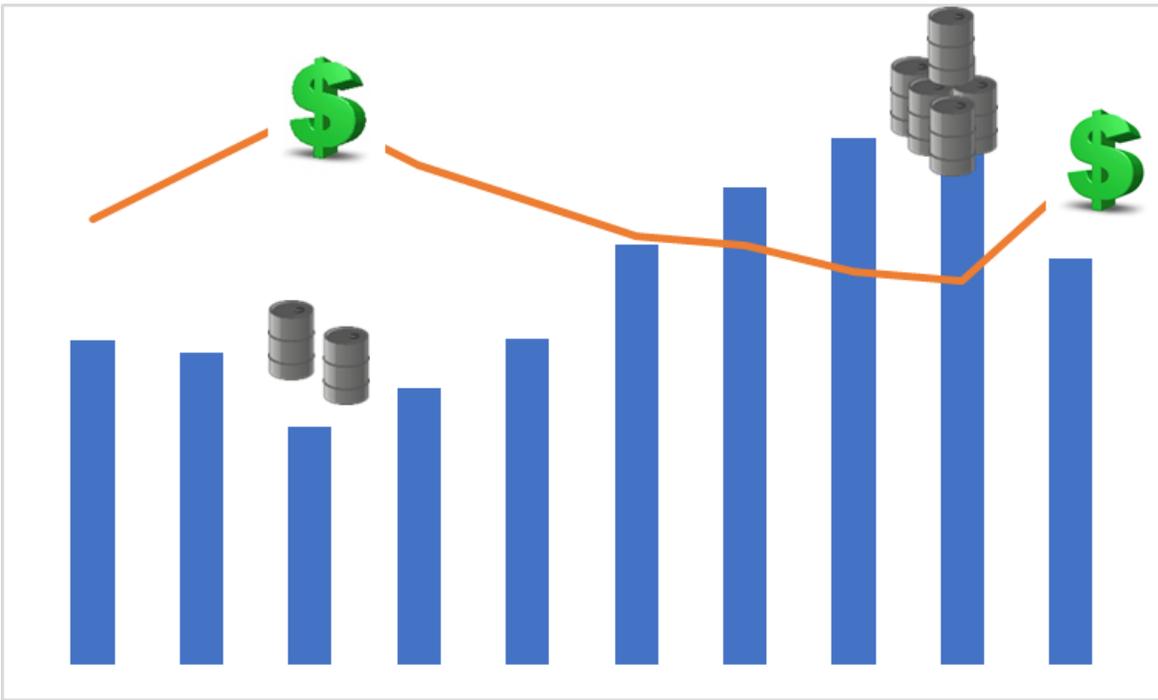


2019 Northeast Maple Business Benchmark



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Learn More About the Northeast Maple Benchmark Project

For more information about participating in the NE Maple Benchmark go to the UVM Extension Agricultural Business website: https://www.uvm.edu/extension/agriculture/agriculture_business_management

For previous Maple Benchmark reports please visit the resource library at:
www.maplemanager.org

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Introduction

The 2019 production season rebounded with a 1% increase in US national syrup production from the previous crop in 2018. The National Agricultural Statistics Service reports a 2019 crop totaling 4,200,000 gallons which is only slightly below the most recent record crop in 2017 (USDA NASS)¹. While the US maple industry continues to grow, historians quickly note that these recent year record crops are still very far from US domestic syrup production totals common in the late 1800's².

Bulk market prices continued a slow decline following reports of a strong 2019 crop year and continued strength of the US dollar. Despite routine fluctuations the US – Canadian currency exchange rate maintained a level above \$1.30 CAD to \$1.00 US (~\$0.77 US to \$1.00 CAD) and averaged approximately \$1.33 CAD to \$1.00 US over the full calendar year.

Statistical reports in 2019 showed another year without dramatic increase in the US tap count. General reports from maple producers and sellers reported an environment of increasing competition for sales. Successive strong crop years bolstering supply, downward price pressure from Canadian import dynamics and more US producers pursuing direct and wholesale market channels reinforced the increased competition. By 2019 the signals to maple owners were clear, business performance in the modern maple era will be impacted by an evolving marketplace.

The 2019 Northeast Maple Business Benchmark report documents the seventh year of financial record analysis for a small group of commercial syrup producers. In 2019 the project has shifted to include maple producers in Vermont, Maine, New Hampshire and Massachusetts. An increasing focus is placed on larger scale enterprises in 2019 and participants had to generate at least \$100,000 in annual gross sales to be included in the study. Tap counts for this year's participant businesses ranged from 6,500 taps to 60,000 taps.

This report includes results from the prior study years 2014-2017. There were no formal group analysis results published for 2018. It is important for readers of this report to understand that the 2019 results published here represent a different mix of participants and a shift to larger tap scale enterprises compared to the 2014-2017 study groups.

The 2019 study group is a small sample of the entire Northeast maple industry. The methods for this project and our reported observations, however, can compel maple business managers to think about 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.

¹ USDA NASS New England <https://www.uvm.edu/sites/default/files/Agriculture/maple-nass-2019.pdf>

² Graham, Gary. 2016. "Maple Production Statistics". The Ohio State University. Available online at: <https://www.uvm.edu/sites/default/files/Agriculture/maple-statistics-report-2016-graham-osu.pdf>

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.

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 cases, 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.

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 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

Ten producers completed financial analysis for the 2019 calendar year. The 2019 study group includes one sap-only producer. The records from this single sap-only producer are included in a small number of benchmark results relating to yield and maple tap density. The sap-only enterprise has been omitted from all other group financial metrics due to significantly different investment, labor and cost factors for this business model.

Tap Number

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

Fuel

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

Market Channels

- 4 producers are categorized as “Bulk” (90% or more of sales from Bulk Sales)
- 5 producers are categorized as “Retail/Wholesale” mix
- 1 producer is a sap only business (the sap-only business has been removed from selected financial analysis results)
- This group benchmark includes a mix of certified organic producers on non-organic producers

Land Use

Table 1: Financial Measures Per Acre

	Range		Average	Median
	Low	High		
Taps Per Acre	46	69	58	57
Gallons Syrup Per Acre	16	51	31	29
Pounds of Syrup Per Acre	176	568	344	317
Production Based Income Per Acre (Gross)	\$629	\$1,385	\$992	\$921
Net Returns Per Acre	(\$295)	\$605	\$122	\$133

Productivity

Table 2: Productivity Per Tap-2019

	Range		Average	Median
	Low	High		
Taps (#)	6,500	65,000	18,760	12,140
Gallons Per Tap	0.25	0.62	0.45	0.44
Pounds Per Tap ³	2.82	6.96	4.99	4.87

Table 3: Productivity Per Tap from 2014 - 2019

	Averages (no group analysis 2018)				
	2014	2015	2016	2017	2019
Gallons Per Tap	0.38	0.40	0.51	0.42	0.45
Pounds Per Tap ⁴	4.3	4.4	5.6	4.7	4.99

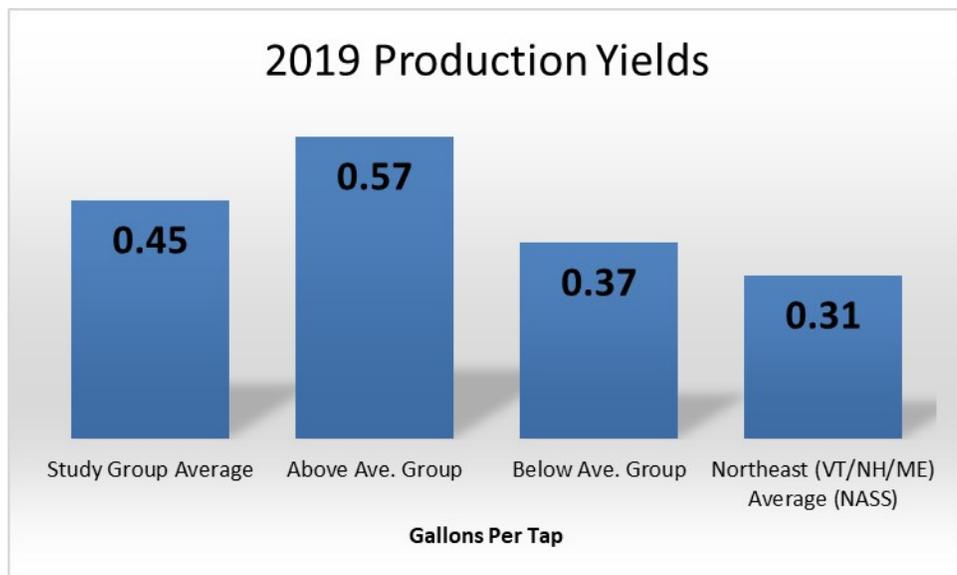
The USDA National Agricultural Statistics Service reported the following average yield for key states in 2019: VT produced is 0.345 gallons of syrup per tap (~3.83 pounds), Maine produced 0.305 gallons of syrup per tap (~3.39 pounds) and New Hampshire produced 0.274 gallons per tap (3.04 pounds per tap)⁵. Production yield averages are shown in Figure 1. The figure indicates the average of the entire study group, the “above average” group (the producers whose yield is greater than 0.45 gallons or 5 lbs. per tap) and the “below average” (the producers whose yield is below 0.45 gallons or 5 lbs. per tap).

³ The conversion factor of 11.138 lbs. = 1 gallon syrup was used when actual records were not available.

⁴ The conversion factor of 11.138 lbs. = 1 gallon syrup was used when actual records were not available.

⁵ Northeast Maple Syrup Production, available online at: <https://www.uvm.edu/sites/default/files/Agriculture/maple-nass-2019.pdf>

Figure 1: Production Yields in 2019



Investments

The average investment of \$57 per tap, shown in Table 4, includes machinery, equipment, buildings and improvements utilized within the maple enterprise. The investment results do not include the capital investment in forest land. Due to the complexity of prior property purchases at different points in time, differences in real estate valuation and difference in appreciation factors across regions, the investment tables below only include intermediate asset investment related to the maple production enterprise.

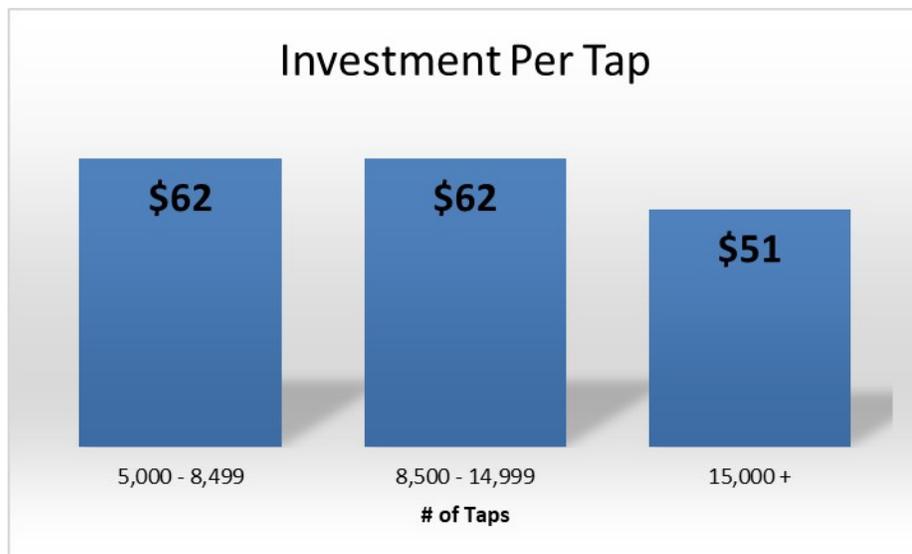
Table 4: Investment Per Tap (cost basis valuation, see definitions)

	Range		Average	Median
	Low	High		
Asset @ Cost Per Tap	\$27	\$94	\$57	\$61

Table 5: Investment Per Tap for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
5,000 – 8,499	\$27	\$91	\$62	\$67
8,500 – 14,999	\$61	\$63	\$62	\$62
15,000 +	\$27	\$94	\$51	\$41

Figure 2: Investment Level at Different Scales (2019)



The average production yield for the entire group is 0.45 gallons per tap or 4.87 pounds per tap in 2019. The “Above Average” group in Table 6 includes all participants with over 0.45 gallons per tap. In 2019 both the above average yield producers and the below average yield producers have similar investment levels.

Table 6: Investment Levels Based on Yield

	Average Investment Value
Above Average Yield Producers	\$ 61 Per Tap
Below Average Yield Producers	\$ 54 Per Tap

New maple businesses will need to access significant capital to establish and outfit an enterprise at commercial scale. The following guidance can be used to estimate a start-up investment that includes purchasing forested property. Using a tap density of 55 taps per acre the following real estate values can be added to the investment benchmarks reported in Table 5: \$1,000 per acre = \$18 per tap; \$1,500 per acre = \$27 per tap; \$2,000 per acre = \$36 per tap; \$2,500 per acre = \$45 per tap and \$3,000 per acre = \$55 per tap.

Table 7, below provides an estimated benchmark for overall capital needed to establish a 5,000 – 20,000 tap enterprise at various forest land valuations. These calculations do not include working capital needed for labor or operating expenses prior to cash inflows. Owners should factor-in their individual working capital needs over the first 18 months of operation.

Table 7: Estimated Start-Up Capital for Various Scales of Operation

Taps	Intermediate Assets	Full Start-Up Per Tap Forest Land \$1,000/A	Full Start-Up Per Tap Forest Land \$2,000/A	Full Start-Up Per Tap Forest Land \$3,000/A
5,000	\$62	\$80	\$98	\$117
10,000	\$62	\$80	\$98	\$117
15,000	\$57	\$75	\$93	\$112
Over 20,000	\$50 ⁶	\$68	\$86	\$105

Expenses

Table 8 – Table 12 report a summary of key expenses. This is not a complete list of all the expense categories present in the full cost of production. This section shows a category for “Labor (paid)” and “All Labor (including unpaid labor)” to show the difference between cash based expenses for employees and the full cost of owner labor. The “variable cost total” and the “fixed cost total” do not include the value of unpaid labor⁷. The results for the full costs of production are provided in Tables 13 - 15.

Depreciation

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

In 2019 depreciation ranged from low of 4% to a high of 34% of production-based income (See Table 11). The average depreciation was 17% of production-based income.

⁶ A small number of analysis for enterprises 20,000 taps or more indicate reduced investment per tap at larger scales. Limited research data, however, prevents a more conclusive measurement of investment efficiency at larger scales.

⁷ 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 14 (with minor rounding discrepancies). This COP does not include the value of unpaid labor. See Table 15 for the full economic COP.

Table 8: Key Expenses Per Gallon (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only) ⁸	\$0	\$1.13	\$0.80	\$0.85
Labor (Paid)	\$0	\$4.96	\$2.41	\$2.27
All Labor (including unpaid Labor) ⁹	\$1.45	\$36.36	\$10.19	\$7.25
Electric	\$0.05	\$1.27	\$0.69	\$0.78
Supplies	\$0.71	\$4.21	\$1.59	\$1.05
Variable Cost Total	\$2.35	\$20.29	\$11.29	\$11.54
Fixed Cost Total	\$1.48	\$14.93	\$7.46	\$7.31
Depreciation	\$1.56	\$8.56	\$4.92	\$4.68

Table 9: Key expenses Per Pound (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only) ¹⁰	\$0	\$0.10	\$0.07	\$0.08
Labor (Paid)	\$0.01	\$0.45	\$0.24	\$0.21
All Labor (including unpaid Labor)	\$0.13	\$3.26	\$0.91	\$0.65
Electric	\$0	\$0.11	\$0.06	\$0.07
Supplies	\$0.06	\$0.38	\$0.14	\$0.09
Variable Cost Total	\$0.21	\$1.82	\$1.01	\$1.04
Fixed Cost Total	\$0.13	\$1.34	\$0.67	\$0.66
Depreciation	\$0.14	\$0.77	\$0.44	\$0.42

⁸ 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. Data points for \$0 fuel expense were removed from average or median cost to show a usable metric for those that do manage a direct expense for fuel purchase.

⁹ The value of unpaid labor has been assigned based on owner hours worked multiplied by \$22 per hour value.

¹⁰ See footnote # 8.

Table 10: Key Expenses Per Tap (All Producers)

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only) ¹¹	\$0	\$0.65	\$0.43	\$0.42
Labor (Paid)	\$0	\$2.97	\$1.33	\$1.03
All Labor (including unpaid Labor)	\$0.97	\$9.21	\$4.18	\$4.03
Electric	\$0.02	\$0.87	\$0.35	\$0.27
Supplies	\$0.26	\$1.98	\$0.83	\$0.56
Variable Cost Total	\$1.39	\$11.23	\$5.83	\$5.33
Fixed Cost Total	\$0.88	\$7.87	\$3.70	\$3.00
Depreciation	\$0.62	\$4.36	\$2.60	\$2.66

Table 11: Key Expenses Expressed as a Percent of Production-Based Income

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only) ¹²	0%	4%	2%	2%
Labor (Paid)	0%	20%	8%	8%
All Labor (including unpaid Labor)	6%	62%	26%	20%
Electric	0%	4%	2%	2%
Supplies	2%	14%	6%	4%
Variable Cost Total	9%	50%	35%	37%
Fixed Cost Total	6%	43%	26%	25%
Depreciation	4%	34%	17%	15%

¹¹ See Footnote # 8.

¹² See Footnote # 8.

Table 12: Bulk Producers Only, Key Expenses Per Pound

	Range		Average	Median
	Low	High		
Fuel (Evaporator Only) ¹³	\$0.04	\$0.10	\$0.06	\$0.04
Labor (Paid)	\$0.01	\$0.45	\$0.23	\$0.24
All Labor (including unpaid Labor)	\$0.13	\$0.65	\$0.42	\$0.45
Electric	\$0.02	\$0.07	\$0.04	\$0.03
Supplies	\$0.06	\$0.16	\$0.09	\$0.07
Variable Cost Total	\$0.21	\$1.22	\$0.81	\$0.90
Fixed Cost Total	\$0.13	\$0.72	\$0.46	\$0.49
Depreciation	\$0.23	\$0.66	\$0.43	\$0.41

Cost of Production, Ratios and Comparisons

Table 13: Cost of Production from Operations (see “Terms and Definitions”)

	Range		Average	Median
	Low	High		
COP (Operations) Per Tap	\$2.27	\$19.10	\$9.52	\$8.92
COP (Operations) Per Gallon	\$3.83	\$35.22	\$18.74	\$17.63
COP (Operations) Per Pound	\$0.34	\$3.16	\$1.68	\$1.58
COP (Operations) Per Acre	\$130	\$874	\$547	\$558

Table 14: Cost of Production with Depreciation

	Range		Average	Median
	Low	High		
COP with Depreciation Per Tap	\$6.63	\$22.80	\$12.13	\$10.19
COP with Depreciation Per Gallon	\$11.20	\$39.65	\$23.66	\$23.22
COP with Depreciation Per Pound	\$1.01	\$3.56	\$2.12	\$2.08
COP with Depreciation Per Acre	\$380	\$1,044	\$697	\$628

¹³ See Footnote # 8.

Table 15: Full Economic Cost of Production

	Range		Average	Median
	Low	High		
Full Economic Cost of Production (COP) Per Tap	\$9.30	\$22.80	\$14.98	\$15.27
Full Economic Cost of Production (COP) Per Gallon	\$15.71	\$73.98	\$31.44	\$29.23
Full Economic Cost of Production (COP) Per Pound	\$1.41	\$6.64	\$2.82	\$2.62
Full Economic Cost of Production (COP) Acre	\$532	\$1,171	\$877	\$854

Table 16: Ratios for All Producers

	Range		Average	Median
	Low	High		
Production Based Income ÷ Investment	12%	64%	40%	46%
Net Returns to Real Estate ¹⁴ ÷ Investment	-6%	30%	6%	5%
Unpaid Labor ÷ Production Based Income	0%	58%	20%	11%
Depreciation ÷ Production Based Income	4%	34%	17%	13%

Table 17: Comparisons of Ratios for 2014 – 2019

	Averages (no group analysis 2018)				
	2014	2015	2016	2017	2019
Production Based Income ÷ Investment	46%	37%	47%	30%	40%
Net Returns to Real Estate ÷ Investment	3%	0%	9%	3%	6%
Unpaid Labor ÷ Production Based Income	19%	29%	24%	33%	20%
Depreciation ÷ Production Based Income	20%	24%	18%	25%	17%
Tap Count (Median reported in this row)	7,200	6,600	6,000	7,300	12,140
Tap Count (Average reported in this row)	11,353	7,909	7,391	7,838	18,760
Gallons Per Tap	0.38	0.40	0.51	0.42	0.45

¹⁴ Net Returns to Real Estate includes all operating costs, depreciation and full economic cost of unpaid labor and management.

It is important for readers to be aware that the study group has shifted from 2014-2019. Certain individuals have entered the project while others are no longer participating. The most significant change occurs with the 2019 analysis year. In 2019 the project has shifted to multiple states in the Northeast and larger tap scale maple enterprises. Table 17 above indicates a notable increase in the median tap count for 2019 compared to the previous years. Readers should also consider that fluctuations in annual yield and market price have significant impact on annual gross sales levels that will influence any metrics based on production based income.

Table 18: Net Returns Divided by Investment for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
Less than 15,000 Taps	-5.7%	8.8%	2.5%	5.0%
15,000 Taps and Larger	-0.7%	29.5%	9.8%	5.1%

The effects of a small study group and large ranges of performance from business to business are highlighted in Table 18. Higher returns cannot be attributed to a size class exclusively when one considers both the average and median descriptive statistics. The larger enterprises of 15,000 taps and larger have a higher average Net Return, however, the group median Net Returns of 5% is similar for both size classes in Table 18.

Table 19: Full Economic Cost of Production Per Pound for Tap Size Groups

Taps	Range		Average	Median
	Low	High		
5,000 – 8,499	\$2.88	\$6.64	\$4.20	\$3.08
8,500 – 14,999	\$1.41	\$1.90	\$1.66	\$1.66
15,000 +	\$1.92	\$2.66	\$2.37	\$2.46

Results in Table 19 indicate that larger scale operations do not necessarily have a lower cost of production as often assumed through the economies-of-scale effect. This result from a small group benchmark is likely impacted by the different market channels and different business models observed for the 2019 participants. The 15,000+ tap group includes multiple businesses that pursue a mixed market channel plan selling via retail, wholesale and bulk outlets. The costs incurred through this additional market and sales activity is embedded in the full cost reported in Table 19. A closer look at the 8,500-14,999 tap scale group reveals that most participants are identifying as bulk-only sellers. A more detailed look at cost of production related to market channels is provided in Table 23.

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 2019 was 5.7% and the Top Profit Group included participants that demonstrated 8.8% to 29.5% “Net Returns ÷ Investment.”

Table 20: 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>
5,000 – 8,499	n/a	\$4.20
8,500 – 14,999	\$1.66	\$1.66
15,000 +	\$2.27	\$2.37

Table 21: 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>
5,000 – 8,499	n/a	\$46.80
8,500 – 14,999	\$18.44	\$18.44
15,000 +	\$25.29	\$26.42

Table 22: 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>
5,000 – 8,499	n/a	\$15.71
8,500 – 14,999	\$16.05	\$16.05
15,000 +	\$14.16	\$13.91

Cost of production is measured in different ways. The per gallon or per pound unit of measure will relate costs to the yield produced (Table 20,21) and provide easy reference back to market prices. The per-tap unit of measure (Table 22) relates costs to the maple resource management, regardless of yield. A “per tap” measure offers an alternative calculation for year-to-year cost management that is not prone to distortion from changes in annual yields.

In 2019, the Top Profit Group show moderately lower costs than the Full Group based on certain measures, but, not consistently for all measures and all size classes. As seen in previous maple benchmark study years, cost management alone is not necessarily linked directly to profitability. A businesses capacity to maximize revenue or prices also influences business profitability.

Market Channel

Table 23: Full Economic Cost of Production and Market Channel

		Range		
Market Channel		Low	High	Average
Bulk	Pound	\$1.41	\$2.29	\$1.88
	Gallon	\$15.70	\$25.51	\$20.94
	Tap	\$9.30	\$22.80	\$15.75
	Acre	\$532	\$1,082	\$878
	% of PBI	63%	101%	81%
Average Profit Margin				19%
Retail/Wholesale	Pound	\$2.62	\$6.64	\$3.58
	Gallon	\$29.23	\$73.98	\$39.84
	Tap	\$12.04	\$18.74	\$14.37
	Acre	\$602	\$1,171	\$876
	% of PBI	54%	138%	101%
Average Profit Margin				- 1%

Previous sections of this report demonstrate there is not always a clear and direct relationship between full cost of production with business scale or full cost of production with business profitability. Looking at market channels in this small group (9 businesses), however, we see two unique trends. Producers identified as “Retail/Wholesale” recorded higher costs per pound and costs per gallon compared to “Bulk Only” producers with lower costs. The two market channel groups show similar total cost per tap and per acre. This alignment in cost magnitude per tap could indicate differences in tap density. Finally, the “Bulk-Only” subgroup demonstrates more favorable average profit margin that includes the interaction of costs and revenue.