

THE ECONOMIC CONTRIBUTION OF MAINE'S MAPLE PRODUCTS INDUSTRY¹

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September 2021

¹ Funding for this project was provided by the Maine Maple Producers Association

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Study Findings

- Maine is the third largest producer of maple syrup in the United States, behind only Vermont and New York.
- Maine's licensed maple syrup producers have been in operation an average of 21 years.
- Maine's maple syrup industry has a high percentage of small producers and relatively few large operations.
- Overall, maple producers reported that the COVID-19 pandemic affected the total amount of syrup and maple products sold, and reduced opportunities for direct-to-consumer sales (e.g., visitors on Maine Maple Sunday and customers on non-special event days). Maine's maple producers were less apt to note that COVID-19 adversely impacted their ability to ship products, to work on maple production, and their ability to hire workers.
- Despite the impacts of COVID-19, Maine's maple producers are optimistic about the future. Collectively, the maple syrup farms in our sample expect to grow by 15 percent between 2021 and 2026.
- Maine's maple industry - which counts the licensed producers, sales at food stores and businesses, and the spending of visitors to maple farms - generates an annual direct contribution to the state's economy of an estimated \$29.8 million in output, 634 full- and part-time jobs, and \$16.8 million in labor income.
- Maine's maple industry has an annual statewide economic contribution, including multiplier effects, of an estimated \$55.6 million in output, 833 full- and part-time jobs, and \$26.9 million in labor income.

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Introduction

Maple sugaring is an important economic and cultural activity in Maine, as in other parts of the northeastern United States. Maine is consistently ranked as one of the nation's top maple syrup producers (both in terms of number of taps and overall syrup production), landing behind only Vermont and New York in 2021 (USDA, 2021). Maine's over 500 maple producers make syrup as well as a wide range of related products (e.g., maple candy, taffy, maple coated nuts, and flavored barbeque sauces).

Maine's maple syrup production expanded by 98 percent over the past fourteen years, growing from 250,000 gallons of syrup in 2007 to 495,000 gallons in 2021. However, the industry's short season (usually late February to mid-April) and heavy reliance on direct-to-consumer sales, left producers vulnerable to both the COVID-19 pandemic and unfavorable (warmer) weather conditions during the most recent season. Total maple syrup production dropped by 17 percent nationally between 2020 and 2021, while Maine saw a 16 percent decline (USDA, 2021).

The purpose of this study is to examine the statewide economic contribution of maple production in Maine. Economic contribution is defined as the output (i.e., revenue), employment and labor income (e.g., wages and salaries, proprietor's income) that are directly associated with maple production activities in Maine, as well as the multiplier effects that are supported by the spending of maple farms, other businesses that are part of the maple industry, and their employees. The economic impact assessment accounts for the production and sales of syrup and other products by maple farms, retail sales at food stores from July 2020 through June 2021, and the sales of "tourism-related" retailers (e.g., gas stations and restaurants) associated with visitors to maple farms (e.g., Maine Maple Sunday and Fall in Love with Maple).

Data Collection and Methodology

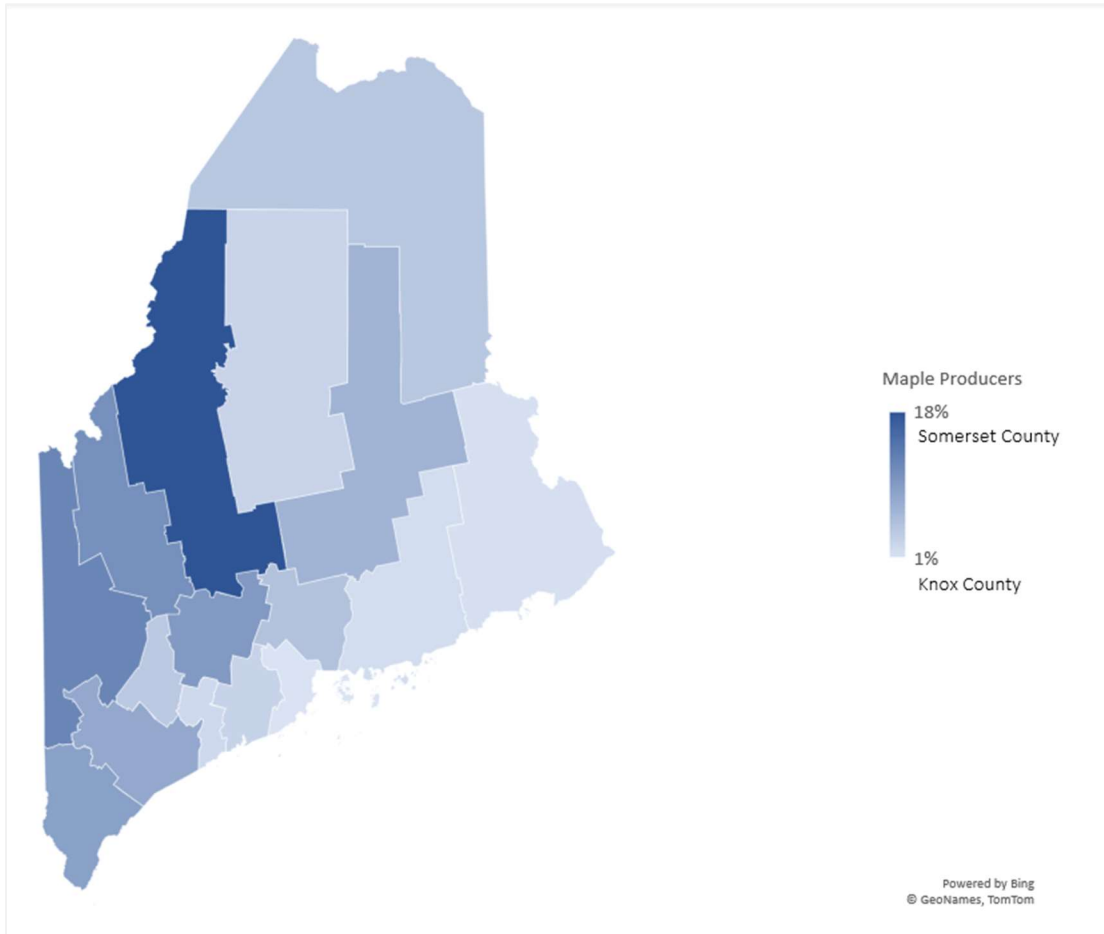
In collaboration with the Maine Maple Producers Association, a survey instrument was designed to collect information from licensed Maine maple producers about their operations, the impacts of COVID-19, and outlook for the future. The survey was distributed using contact information (emails and mailing addresses) provided by the Maine Maple Producers Association. The first round of surveys took place in July of 2021, and replacement surveys were sent to non-respondents in August of 2021. The original target population consisted of 527 licensed maple farms, and this group decreased to 492 after removing those that were undeliverable (surveys that were returned as undeliverable via the U.S. Postal Service). As of September 1, 2021, we had received 107 returned surveys. This translates into a response rate of about 22 percent.

This study utilized the IMPLAN regional economic model for Maine. The model accounts for over 500 industries to estimate regional and industry-specific economic impacts. This includes data on transactions occurring between local businesses, spending patterns for households, and transactions occurring between local businesses and the rest of the world. IMPLAN uses data from County Business Patterns from the U.S. Census Bureau, Regional Economic Information System and the Bureau of Economic Analysis as well as the ES-202 statistics from the Bureau of Labor Statistics.

Characteristics of Maple Producers

Maple producers are found in every Maine county, with most producers (in terms of number of license holders) located in the western part of the state (Figure 1).

Figure 1. Percent of Maine Maple License Holders by County



Source: Data provided by the Maine Maple Producers Association on Maine maple license holders.

Table 1 shows the age distribution of the maple producers (i.e., when they began operations) that responded to the survey. Seven percent of survey respondents began tapping trees prior to 1970 and about 76 percent have been in operation since at least 1989. Notably, about 14 percent of responding operations began tapping trees during the 2000s, and 42 percent in 2010 or later.

Table 1. Age Distribution of Maple Production Operations in Maine (n = 74)

Year that Operation began Tapping Trees	Percentage of Operations
Before 1970	7%
1970 to 1979	6%
1980 to 1989	11%
1990 to 1999	20%
2000 to 2009	14%
2010 or Later	42%

Average Age of Operations, as of 2021	21 years
Median Age of Operations, as of 2021	17 years

Note. Information is from a University of Maine survey of maple producers that are licensed in Maine

Table 2 summarizes the size distribution of responding producers (as measured by the total number of taps on land that is leased and owned by the maple farms). About 64 percent of Maine maple farms had fewer than 1,000 taps. Furthermore, about 18 percent of the maple farms had fewer than 250 tap. At the opposite end of the spectrum, 9 percent of the operations had over 10,000 taps. The sample had an average of 2,437 taps – which is about 45 percent less than the average number of taps (3,586) calculated using data from the United States Department of Agriculture. This suggests that, in terms of average size, the survey respondents were significantly smaller (in terms of number of taps) than the true population of all Maine licensed maple producers.

Table 2. Size Distribution of Maple Production Operations in Maine (n = 59)

Number of Taps, 2021	Percentage of Operations
Less than 100	10%
100 to 249	8%
250 to 499	22%
500 to 999	27%
1,000 to 9,999	24%
10,000 or more	9%

Average Number of Taps	2,473 taps
Median Number of Taps	550 taps

Note: Information is from a University of Maine survey of maple producers that are licensed in Maine. Figures include taps on land that is owned and leased by the maple farms.

Impacts of COVID-19

COVID-19 created major health and economic challenges across Maine – the maple producers were hit particularly hard given the short season (late February to mid-April) to tape trees and heavy reliance on direct-to-consumer sales (90 percent of respondents reported direct-to-consumer sales being a part of their business model). The survey asked respondents to identify how COVID-19 affected their maple syrup production and operations.

Table 3. Impacts of COVID-19 on Maple Syrup Production and Operations (n=varies)

Potential Impact	Percentage of Operations
Affected amount of syrup and products sold (n=57)	60%
Affected number of visitors to Maine Maple Sunday (n=60)	57%
Affected number of customers on non-special event dates (n=57)	47%
Affected ability to purchase supplies (n=55)	44%
Affected non-labor costs (n=52)	21%
Affected ability to ship products (n=54)	15%
Affected your own ability to work on maple production (n=57)	14%
Affected ability to hire workers (n=52)	12%

Note. Information is from a University of Maine survey of maple producers that are licensed in Maine

The COVID-19 impacts listed in Table 3 are in descending order of the percentage of respondents that indicated that COVID-19 impacted their maple syrup productions and operations. More than one-half of respondents indicated that the pandemic influenced the total amount of syrup and products sold (60 percent) and number of visitors to Maine Maple Sunday (57 percent). Other COVID-related challenges included impacts on the number of customers on non-special event days (47 percent) and the ability to purchase supplies (44 percent). Maple producers were less likely to report that COVID-19 affected their ability to ship products (15 percent), their ability to work on maple production (14 percent) and their ability to hire workers (12 percent).

Growth of Maple Production: 2018 to 2021 and Expectations for the Future

To understand how the industry is changing, producers were asked to provide information on their current total number of taps, their number of taps in 2018 and their anticipated number of taps in 2026. Overall, respondents reported an 11 percent increase in taps between 2018 and 2021.

In Table 4 we see that the growth (percentage change) in number of taps varied widely by the maple syrup farm's initial size in 2018. Farms in operation with less than 100 taps in 2018 grew by 93 percent while those in operation with 10,000 or more taps grew by 7 percent over the same period. Although the smallest category of maple syrup farms exhibited the most rapid growth rate, it only accounts for 3 percent of the overall growth in the number of taps reported by producers. Those with more than 1,000 taps accounted for 85 percent of the growth in reported taps.

Table 4. Percentage Change in Taps, 2018 – 2021 (n=56)

Number of Taps, 2018	Growth in Taps, 2018 - 2021	Contribution to Past Growth
Less than 100	93%	3%
100 to 249	14%	1%
250 to 499	39%	11%
500 to 999	-1%	-1%
1,000 to 9,999	21%	49%
10,000 or more	7%	36%

Notes. Information is from a University of Maine survey of maple producers that are licensed in Maine. Figures are based on maple syrup producers (in the sample) that were in operation in 2018 and 2021. The "Growth in Taps" is the percentage change in number of taps for operations in the given size category. "Contributions to Past Growth" is the percentage of the total change in the number of taps (for all operations in the sample) that is accounted for by operations in the given size category.

Despite recent issues facing Maine maple syrup production (e.g., COVID-19, weather conditions during the spring of 2021), the responding producers are optimistic about the future. Collectively, the maple syrup farms in our sample expect to grow by 15 percent between 2021 and 2026. As was the case with the growth that occurred between 2018 and 2021, the outlook varies by operation size.

As seen in Table 5, operations with less than 100 taps in 2021 expect to have the largest percentage change in taps (69 percent). The second fastest projected growth rate can be found in operations with between 1,000 and 9,999 taps. This category of maple farms is expected to account for 65 percent of the future growth in the overall number of taps (contributed by maple syrup farms that are currently in operation).

Table 5. Projected Percentage Change in Taps, 2021 – 2026 (n=56)

Number of Taps, 2021	Growth Rate, 2021 - 2026	Contribution to Future Growth
Less than 100	69%	2%
100 to 249	28%	1%
250 to 499	21%	6%
500 to 999	31%	12%
1,000 to 9,999	34%	65%
10,000 or more	3%	13%

Notes. Information is from a University of Maine survey of maple producers that are licensed in Maine. The “Growth in Taps” is the percentage change in number of taps for operations in the given size category. “Contributions to Future Growth” is the percentage of the total change in the number of taps (for all operations in the sample) that is accounted for by operations in the given size category.

To understand how maple farms perceive the environment for syrup production in Maine, the survey asked about factors affecting the viability of their operations. The survey included 20 growth factors, and respondents were asked to indicate whether each factor “affects the future viability” of their maple farms. The growth factors listed in Table 6 are in descending order of the percentage of respondents that indicated the factor affects their future viability. More than one-half of respondents indicated that spring weather conditions (76 percent), selling directly to consumers (58 percent) and equipment costs (55 percent) are influential factors. At the bottom of Table 6 we see that out-of-state marketing efforts matter to less than 15 percent of the survey respondents. Other factors that less than one-quarter of all respondents indicated as affecting their future viability include: industry programs, non-environmental regulations, labor costs, finding qualified workers, and land lease costs.

Table 6. Factors Affecting the Future Viability of Maine’s Maple Syrup Producers (n=varies)

Growth Factor	Percent of Operations Identifying that the Growth Factor Affects Viability
Spring weather conditions in recent years (n=62)	76%
Selling directly to consumers (n=57)	58%
Equipment costs (n=58)	55%
Website and social media (n=56)	41%
Maine Maple Sunday (n=60)	40%
Energy costs (n=56)	38%
Maine retail stores selling syrup from out of state (n=55)	36%
Property taxes (n=57)	33%
Wholesale syrup prices (n=55)	33%
Cooperative Extension programs (n=54)	32%
Government programs (n=54)	30%
Competition in Maine (n=56)	27%
Costs of purchasing land (n=58)	26%
Environmental regulations (n=57)	25%
Industry programs (n=54)	24%
Non-environmental regulations (n=57)	24%
Labor costs (n=56)	23%
Finding qualified workers (n=55)	22%
Land lease costs (56)	21%
Out-of-state marketing (e.g., The Big E Fair) (n=56)	14%

Note. Information is from a University of Maine survey of maple syrup producers that are licensed in Maine.

Economic Impact Analysis

Table 7 presents information on the annual statewide economic contribution of maple production in Maine. Impact figures are based on information collected from the survey of licensed maple farms, data from the United States Department of Agriculture, visitor spending figures from the Maine Office of Tourism, and an input-output (IMPLAN) model of Maine’s economy. The direct output of \$29.8 million is the estimated revenue generated by the production and sales of maple syrup and other maple products by Maine maple operations, retail sales of maple syrup at food stores in Maine, and the estimated spending of Maine Maple farm visitors, (e.g., Maine Maple Sunday and Fall in Love with Maple) on “tourism-related” items such as gasoline and meals.

Table 7. Economic Contribution of Maple Production in Maine, 2021

	Direct Contribution	Multiplier Effects	Total Contribution
Output	\$ 29,831,933	\$25,776,960	\$55,608,893
Employment	634	199	833
Labor Income	16,833,000	\$10,053,240	\$26,886,240

Notes: Direct contribution includes estimated economic activity associated with maple syrup production, production of other maple products (e.g., candy), retail sales of maple syrup and visitor expenditures related to Maine Maple Sunday and other events. Estimates of direct contribution are based on information from the United States Department of Agriculture, a University of Maine survey of Maine maple producers and data from the Maine Office of Tourism. The multiplier effects are calculated using an economic impact (IMPLAN) model of the Maine economy.

The direct employment of an estimated 634 full – and part-time jobs includes people involved in the production of maple syrup and other maple products, as well as workers in food stores (that sell maple syrup) and businesses supported by the spending of visitors to Maine’s maple farms. Most of the jobs counted in the direct impact, however, are associated with maple production farms, either as operators or paid employees. The United States Department of Agriculture defines a “farm” as a place that makes or sells \$1,000 or more of agricultural products. Using a cut-off of \$1,000 or more in sales to define a farm

proprietor and information from the survey of licensed maple producers, we were able to estimate the total number of farm operators in Maine. Information from the survey was also used to estimate the number of (hired) workers involved in maple production. The direct labor income of \$16.8 million includes proprietor's income received by the farm operators (based on information from the survey), wages and salaries paid to hired workers (also reported in the survey), as well as the estimated labor income associated with the workers at food stores that sell maple syrup and businesses that serve visitors to Maine's maple farms.

The multiplier effects, estimated by the Maine IMPLAN model, are the economic activity – that is, output, employment, and labor income – supported by the spending of businesses and workers that are associated with the production of maple syrup and related products, as well as the economic activity generated by the retail sales of maple syrup and the sales associated with visitors to maple farms. The production and sales of maple productions in Maine has an annual statewide economic contribution, including multiplier effects, of an estimated \$55.6 million in output, 833 full- and part-time jobs, and \$26.9 million in labor income.

Summary

Maine has the third largest maple production industry in the United States—behind Vermont and New York—in terms of numbers of taps and syrup production in 2021. The maple production industry in Maine is characterized by a relatively small number of very large farms accounting for most of the syrup that is produced. Maine's licensed maple syrup producers have been in operation an average of 21 years, and many of the farms appear to span multiple generations. Seven percent of survey respondents began tapping trees prior to 1970 and about 76 percent have been in operation since at least 1989.

COVID-19's impact was felt most acutely among maple producers in the total amount of syrup and products sold, and number of visitors to Maine Maple Sunday and customers on other non-special event days. Respondents were less likely to report COVID-19 related impacts around the ability to find workers and ability to work on the production of maple syrup. Despite the understandable frustrations seen since March 2020, Maine's maple producers are optimistic about the future. Collectively, the maple syrup farms in our sample expect to grow by 15 percent between 2021 and 2026.

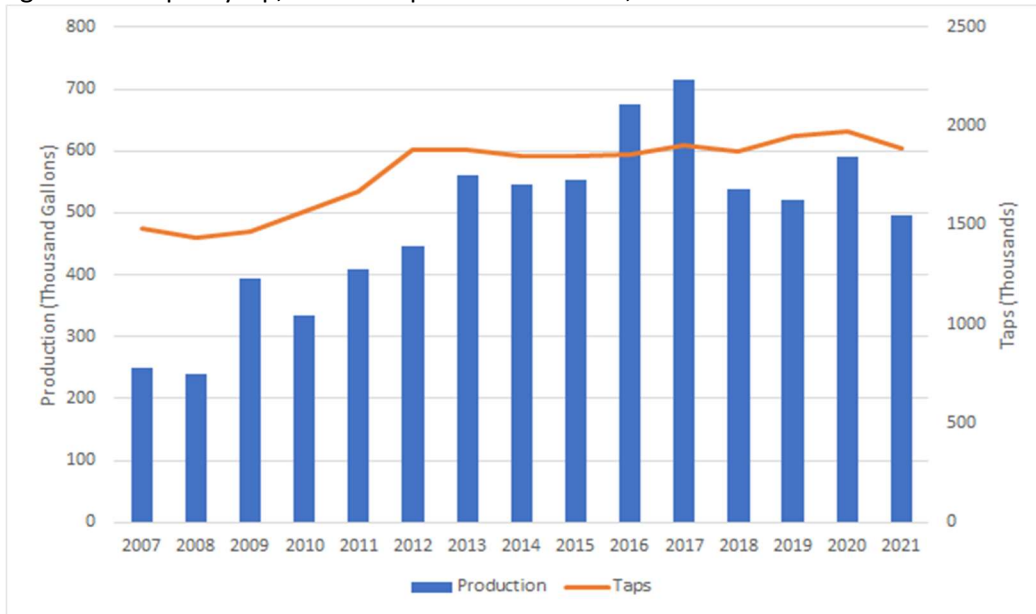
The maple production industry in Maine—which counts the licensed producers, and estimated sales at food stores and businesses impacted by Maine Maple Sunday and other events—generated an estimated direct contribution to the state's economy of an estimated \$29.8 million in output, 634 full- and part-time jobs, and \$16.8 million in labor income between July 2020 and June 2021. The direct employment and labor income figures include farm operators (i.e., one person for each maple farm that generated more than \$1,000 in sales) and estimated proprietor's income. Maine's maple industry has an annual statewide economic contribution, including multiplier effects, of an estimated \$55.6 million in output, 833 full- and part-time jobs, and \$26.9 million in labor income.

Works Cited

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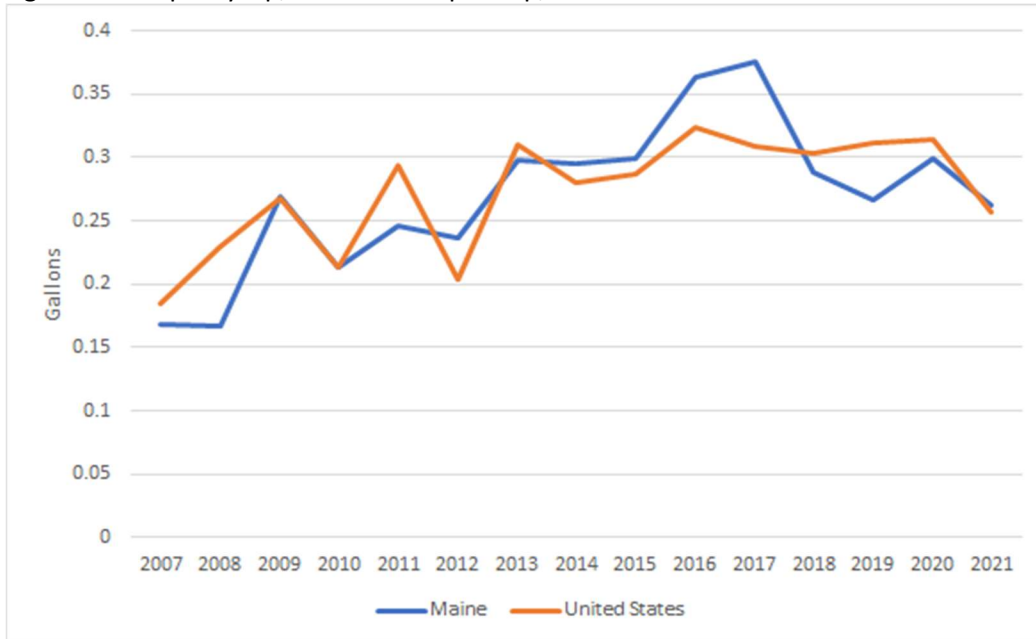
Appendix: Supplemental Figures

Figure A1. Maple Syrup, Maine: Taps and Production, 2007 - 2021



Source: United States Department of Agriculture, National Agricultural Statistical Survey

Figure A2. Maple Syrup, Maine: Yield per Tap, 2007 - 2021



Source: United States Department of Agriculture, National Agricultural Statistical Survey