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**AN ECONOMIC STUDY OF
MAPLE SAP AND SYRUP PRODUCTION
IN NEW YORK STATE
1969**

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The method of obtaining the data, the rates used in computations, the form of the presentation and the observations are the responsibility of the author. He appreciates the advice and counsel given to him and his field men but he alone is responsible for the conduction and results of the study.

FOREWORD

The South Central New York Resource Conservation & Development Project is locally sponsored by the Soil & Water Conservation Districts and the Boards of Supervisors of the counties of Broome, Chenango, Cortland, Delaware, Madison, Otsego and Tioga.

The principal objective of this project is to improve the economy of the area through the wise use, conservation and development of the natural resources. Project leaders believe that the maple product industry holds potential for increasing employment and income from an under-utilized resource.

Less than one percent of the sugar maple trees in the seven counties are being tapped. The local and worldwide markets for maple products are not fully supplied.

Although the number of producers in the area has declined steadily over the years, some have been able to earn a substantial income from maple products. New equipment offers promise of increased efficiency and profit.

However, economic data concerning the industry was needed to determine the best way to realize this potential. Since available data was out of date, a new economic study of maple syrup production in New York was needed. The feeling was that such a study could provide a basis for decision on financing and also encouraging the expansion of present facilities and new enterprises.

Upon recommendation of the Project Steering Committee, funds were made available by the Soil Conservation Service under the authority of Public Law 87-703 to share the cost of this study with Cornell University.

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MAPLE SYRUP PRODUCTION
IN NEW YORK STATE

Maple Syrup producers in the United States produce one million gallons of syrup including syrup later made into sugar (Table 1). Canadian maple producers account for two or three times that much.

Table 1. MAPLE SYRUP PRODUCTION
United States, 1962-66, 1967, 1968

State	1962-66	1967	1968	1969
	- 1,000 gallons -			
New York	458	275	300	348
Vermont	419	310	285	290
Pennsylvania	102	65	72	86
Wisconsin	100	100	100	65
Ohio	96	69	68	84
Michigan	86	60	72	78
New Hampshire	50	45	38	44
Massachusetts	38	28	24	29
Maryland	13	10	10	*
Maine	9	9	7	8
Minnesota	7	8	7	*
United States	1,378	979	983	1,032

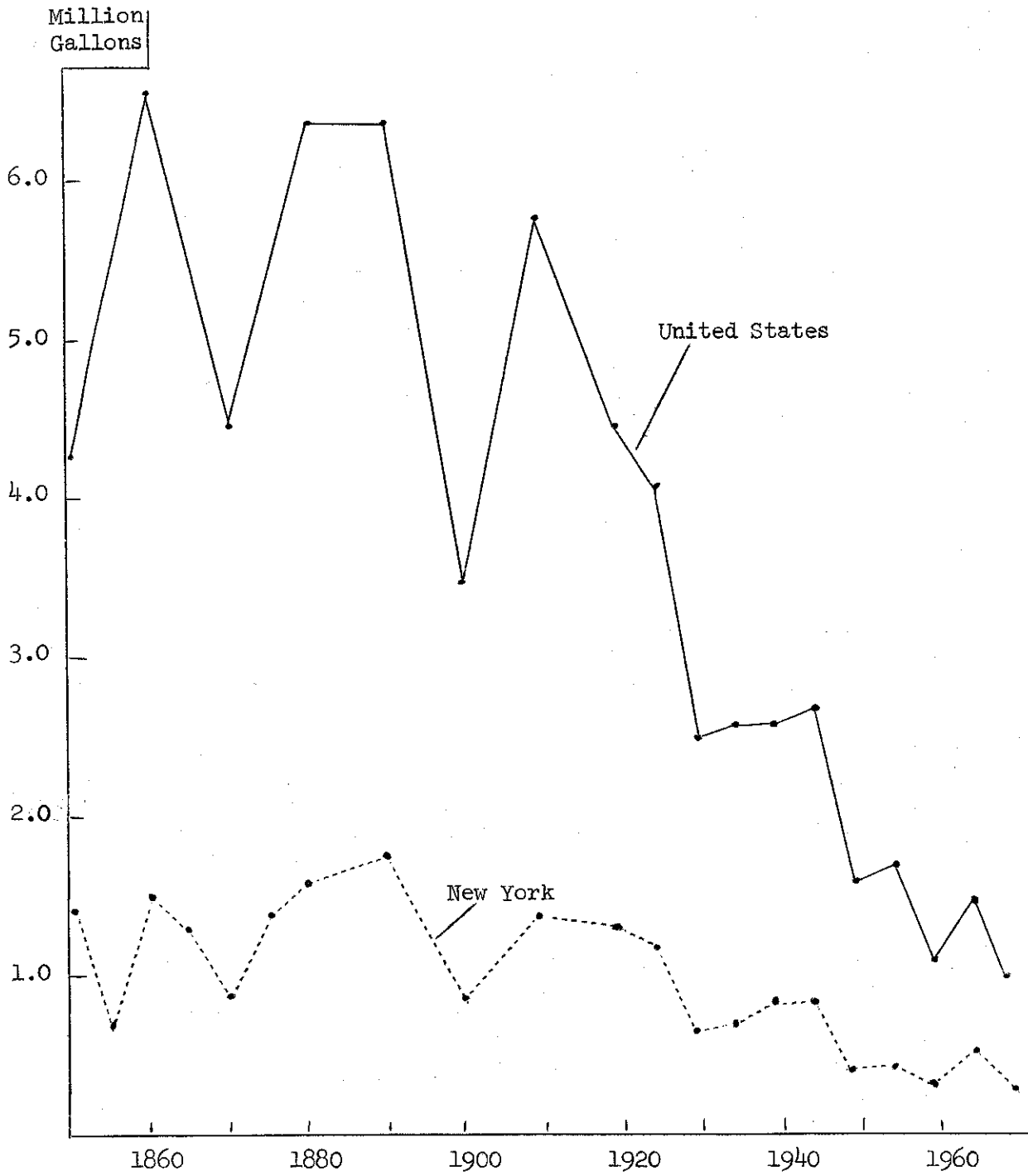
* Estimates discontinued.

About one-third of the domestic production is from New York State and only one state, Vermont, approximates the New York level. These observations are based on the 1962-68 average. Although these two states were still by far the most important in 1967 and 1968, they had lower production in those poor sugaring years. In 1969 production was up somewhat but did not approach the 1962-66 level.

Maple syrup production in the United States has declined greatly from the amounts produced when maple syrup, sugar and candies were a principal source of sweetening in some areas. At one time more than six million gallons of maple syrup (or the equivalent in products) could be expected to be produced in the United States in a good year (Figure 1). New York's share of that production was as high as 1.8 million gallons. This is about 30 percent of the United States production.

Figure 1.

UNITED STATES AND NEW YORK
MAPLE SYRUP PRODUCTION
1850-1968



In the years since about the turn of the century the United States production of maple syrup has declined to the million gallon current level. New York's share of that production has remained constant.

By contrast Canadian production of maple syrup was 2.2 million gallons in 1870, it increased to 3.1 million gallons in 1890, and, after some fluctuation and downward trend in the 1920's and 1930's, was 3.1 million gallons in 1959.

The location of the production of Maple Syrup in the United States has changed considerably in the last century (Table 2). In 1870 producers in states such as Illinois, Iowa, Indiana, Missouri, Kentucky, Tennessee and Virginia contributed considerably to the national production and now produce almost no syrup. Ohio, the third most important state in the production of syrup in 1870 produced 14 percent as much in 1964 and was down to 6,800 gallons in 1968 (Table 1). This was only 7 percent of that state's production in 1870.

The general decline in the amount of maple syrup produced is probably due to the improvements in transportation which enabled the importation of cane sugar at competitive prices and the development of the sugar beet industry in some areas. The decline also was associated with hill farms going out of production.

It can only be a matter of conjecture why there has been such a great decline in production in some states and elimination entirely in others. Because of their climate, the northern states probably obtain higher rates of sap production per tree. This would tend to give them an advantage in efficiency of production, and, consequently, an economic advantage. Coupled with this is the likelihood that producers in the states of the greatest decline found that there were other activities that would return them more for their time than maple sugaring. And they turned to those activities.

Table 2.

MAPLE SYRUP PRODUCTION

State	1870	1964
Connecticut	1,951	2,693
Illinois	27,487	---
Indiana	394,421	---
Iowa	27,626	---
Kentucky	82,750	---
Maine	48,571	7,510
Maryland	9,182	11,615
Massachusetts	52,301	35,021
Michigan	246,369	90,931
Minnesota	39,030	---
Missouri	30,939	---
New Hampshire	241,972	52,708
New York	882,553	423,254
North Carolina	3,075	---
Ohio	786,253	108,348
Pennsylvania	232,625	109,104
Tennessee	21,714	---
Texas	5,032	---
Vermont	1,123,811	406,603
Virginia	42,037	---
West Virginia	81,535	4,260
Wisconsin	94,617	60,837
Other	662	---
Total United States	4,476,513	1,312,884

Source: Data compiled by Lyle S. Raymond from U.S. Census of Agriculture, 1964 and U.S. Census, 1870.

Within New York State there has been less shifting of production of maple syrup. Generally, those areas which were important in the production a hundred years ago are the same as those which are important now. The southwestern part of the state, the northern counties and the southcentral area were the important areas in 1870 and are still the important sources of maple syrup and maple products within the state.

To improve the knowledge about the New York maple syrup industry 149 producers were visited in the major production areas of the State in 1968. These were the Southwest, Southcentral and North. Twenty-six counties were involved in the study. The information obtained from these visits was summarized and reported in A.E. Res. 278, Management Practices in Maple Syrup Production in New York, 1968, DuBois T. Smith, Department of Agricultural Economics, Cornell University, Ithaca, New York.

No effort was made to get a random sample of maple producers. Instead an attempt was made to get enough producers with all sizes of enterprises to enable a study of the methods of production for maple syrup enterprises ranging from small to large.

The number of producers visited in each area was not proportionate to the number of farmers in each area with maple enterprises. In the Northeast a much higher proportion was visited than in other areas.

The selling price of syrup asked by the producers has not kept up with the rise in wages, the rise in equipment costs and inflation generally. Substantially higher sales prices are in order to stay abreast of the inflationary trend. Prices of maple syrup have gone up from \$1.80 per gallon in 1924 to \$5.95 in 1968 (Table 3). However, wages have gone up more rapidly and, consequently, the price of syrup relative to wages is considerably less favorable for production than it was in years past. For many years the weekly earnings of production workers in manufacturing industries would have bought about 15 gallons of maple syrup. Now-a-days the earnings will buy more than 20 gallons of syrup.

Table 3.

PRICES OF MAPLE SYRUP
RELATIVE TO WAGE RATES

Year	Retail price of maple syrup	Weekly earnings of production workers in manufacturing industries	Gallons of syrup to pay for a weeks earnings
1924	\$1.80	\$27.68	15.4
1929	1.88	29.99	16.0
1934	1.30	23.19	17.8
1939	1.60	25.85	16.2
1944	3.00	47.01	15.0
1949	4.20	57.47	13.7
1954	4.35	71.50	16.4
1959	4.50	87.79	19.5
1964	4.55	101.72	22.4
1968	5.95	120.00	20.2

The Study of Costs and Returns

In the study of the costs and returns in producing maple sap and syrup some of the producers who had participated in the 1968 study of maple syrup production practices were asked to keep records of the time spent in their "sugaring" and to keep records of their expenditures, production and receipts. There were 64 producers who were in the earlier study and supplied information for this study of costs and returns. From the records kept by these producers, and from additional information which they were asked to recall, costs were determined for the production of (1) maple sap and (2) maple syrup.

The "North" and "Northeast" areas of the Management Practices Study were combined in the cost study and the summary which follows shows the cost and returns information for three areas.

The production of maple sap was treated as a separate activity from the production of maple syrup. This was done because there is an increasing amount of sap being sold to others for processing. There were in fact two maple sap producers from whom information was obtained who sold all of the sap they produced. Some others sold part of their sap production. Because of this trend it was felt that the costs in producing sap ought to be separated from the maple syrup production to enable a better economic analysis of the two parts of sugaring. Also, since the buyers of sap mixed it with their own production and were thus unable to separate the returns from the syrup and other maple products derived therefrom it was impossible in many cases to determine the cost of maple syrup from the initial work of bush maintenance and tree tapping all the way through to the sale of the maple syrup.

The Producers

As would be expected, since the producers included in the cost study were a part of those in the management practices study, most of the producers of both sap and syrup were dairy farmers who did some sugaring on the side (Table 4). There were in fact only two producers who were visited who gave maple production as their principal business.

As with the Management Practices Study no effort was made to get a random sample of producers. Those who were included were asked to do so to enable comparisons of costs and returns for different size enterprises and different management practices. The 64 maple sap enterprises ranged in size from 200 to 8,000 taps. The amount of sap harvested ranged from 2,800 to 80,000 gallons.

The 62 maple syrup enterprises ranged in size from 93 to 6,000 gallons production. There were 45 individuals who produced all of their syrup from their own sap. Nineteen or 30 percent bought some sap. Ten out of 13 farmers who produced more than 900 gallons of syrup bought sap to add to their own production. Altogether 15 percent of the sap which was boiled by the farmers who were studied was purchased from others.

COSTS AND RETURNS IN
PRODUCING MAPLE SAP

For the study of the costs of producing maple sap and syrup the farmers visited were in three areas of the state: Northern, Southwestern and South-central.

There was 64 farmers who produced maple sap and provided cost information. Two of these sold their production and, hence, were included in the study of the cost of producing maple sap but not in the study of the costs of producing maple syrup.

There were more similarities between the areas than there were differences but there were significant differences. There was less emphasis on tubing in the Northern and much more in the Southcentral area. The sap yield per tap hole was somewhat more in the Southwestern than in the other areas.

Table 4. MAJOR ACTIVITY OF MAPLE PRODUCERS VISITED IN NEW YORK STATE, 1969

Major Activity	Number of Producers Visited in Each Study											
	Southwest			Southcentral			Northern (& Northeastern)			All producers		
	Practices	Cost	Sap Syrup	Practices	Cost	Sap Syrup	Practices	Cost	Sap Syrup	Practices	Cost	Sap Syrup
Dairy	38	16	15	32	14	14	37	13	13	107	43	42
Retired	2	--	--	1	1	1	2	--	--	5	1	1
Misc. farm	5	3	3	1	--	--	2	2	2	8	5	5
Misc. other	8	4	4	5	6	5	9	3	3	22	13	12
Maple	3	--	--	4	2	2	0	--	--	7	2	2
All producers	56	23	22	43	23	22	50	18	18	149	64	62

NORTHERN AREA

There were 18 producers in Northern New York who kept records and provided information to study their costs and returns. They had from 500 to 8,000 taps and produced from 5,000 to 80,000 gallons of sap.

Labor Use

In the Northern area the farmers with large maple sap enterprises had similar work patterns to those with small (Table 5). They spent a little more time, relatively, in gathering sap and less in tapping.

Table 5. LABOR USED PER FARM
IN PRODUCING MAPLE SAP
18 Producers in Northern New York, 1969

Item	Average for producers with:		Average		Average	
	Less than 2000 taps	2000 taps or more	Less than 2000 taps	2000 taps or more	for all producers	for all producers
Number of producers	7	11			18	
Number of taps	996	3,877			2,757	
Gallons of sap: per producer	8,886	32,386			23,247	
per tap	8.9	8.4			8.4	
	Hours	Percent	Hours	Percent	Hours	Percent
Opening & starting	5	2	5	1	5	1
Tapping for: buckets	41	18	87	13	69	14
tubing	18	8	62	9	45	9
Gathering (buckets)	126	54	389	58	287	58
Hauling sap: buckets	---	---	---	---	---	---
tubing	5	2	9	2	7	1
Checking tubing	---	---	6	1	4	1
Take down & clean: buckets	25	11	73	11	54	11
tubing	8	3	36	5	25	5
Miscellaneous	4	2	1	*	2	*
Total	232	100	668	100	498	100

*Less than 1 percent

On the basis of amount of time per 100 taps farmers with large enterprises were considerably more efficient. They spent 6 hours per 100 taps, or 25 percent less time in doing the work (Table 6). The gains were small in each of the jobs related to sap production but they added up to a sizable total saving.

The small but consistent, (and in total significant) savings of time were also evident when measured in the amount of time required to produce 100 gallons of maple sap.

Table 6. LABOR USED PER 100 TAPS
IN PRODUCING MAPLE SAP
18 Producers Northern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	7	11	18
Number of taps per producer	996	3,877	2,757
- Hours -			
Opening & starting	0.5	0.1	0.2
Tapping for: buckets	4.1	2.3	2.5
tubing	1.8	1.6	1.6
Gathering (buckets)	12.6	10.0	10.4
Hauling sap: buckets	----	----	----
tubing	0.5	0.2	0.3
Checking tubing	----	0.2	0.1
Take down & clean: buckets	2.6	1.9	2.0
tubing	0.8	0.9	0.9
Miscellaneous	<u>0.4</u>	<u>*</u>	<u>0.1</u>
Total	23.3	17.2	18.1
Total per 100 gallons of sap	2.6	2.1	2.1

* Less than 1 percent

Costs and Returns

The information obtained from the Northern New York maple producers indicated that, whether the enterprise was large or small, at the prevailing prices set on sap, the activity is not profitable (Table 7). Only one of the 18 producers of sap showed a profit at the rate charged for labor, equipment, etc. and the values placed on the sap. The farmers with large enterprises were somewhat more successful than their smaller competitors. Their costs were relatively somewhat lower, hence, although they had higher total costs and returns, (and losses) their losses were relatively smaller than those of the farmers with small enterprises.

The farmers with the large enterprises received about 70 cents return for each dollar that was spent in harvesting maple sap. Their return per hour of labor spent in the activity was 36 cents. Even with this low return they were better off than their competitors with small "maple" enterprises. This group received only 51 cents for each dollar spent. They lacked 16 cents of making any return for their time.

Table 7. AVERAGE COSTS AND RETURNS
PER PRODUCER OF MAPLE SAP
18 Producers in Northern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	7	11	18
Taps per producer	996	3,877	2,757
Gallons of sap per producer	8,886	32,386	23,247
Maple stand	\$ 88	\$ 344	\$ 245
Equipment	297	1,027	743
Labor	458	1,168	892
Tractor, truck, horses	106	255	197
Supplies	15	52	37
Interest & overhead	<u>43</u>	<u>129</u>	<u>96</u>
Total cost	\$1,007	\$2,975	\$2,210
Value of sap	<u>513</u>	<u>2,045</u>	<u>1,449</u>
Gain	-\$ 494	-\$ 930	-\$ 761
Return per dollar of cost	\$.51	\$.69	\$.65
Return per hour of labor	-\$.16	\$.36	\$.26

It cost the farmers with large enterprises about 25 percent less per 100 taps to produce maple sap (Table 8). There were some savings in equipment and materials used in sap production but the largest reduction in cost was in the cost of labor. Even though the farmers with large enterprises valued their labor at slightly higher rates, the cost for the time required to care for 100 maple taps was about one-third less.

Table 8.

AVERAGE COSTS AND RETURNS
PER 100 TAPS IN PRODUCING MAPLE SAP
18 Producers in Northern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	7	11	18
Taps per producer	996	3,877	2,757
Maple stand	\$ 8.85	\$ 8.87	\$ 8.87
Equipment	29.79	26.49	26.95
Labor	46.01	30.13	32.36
Tractor, truck, horses	10.69	6.57	7.15
Supplies	1.46	1.33	1.35
Interest & overhead	<u>4.29</u>	<u>3.34</u>	<u>3.48</u>
Total	\$101.09	\$ 76.73	\$ 80.16
Value of sap	<u>51.51</u>	<u>52.74</u>	<u>52.57</u>
Gain	-\$ 49.58	-\$ 23.99	-\$ 27.59

Computed on the basis of costs and returns per 100 gallons of sap the farmers with large enterprises were successful only in that they did not lose as much as did their smaller competitors in the area (Table 9). Their losses were only half those of the farmers with small enterprises.

Table 9.

AVERAGE COSTS AND RETURNS
PER 100 GALLONS OF MAPLE SAP
18 Producers in Northern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	7	11	18
Taps per producer	996	3,877	2,757
Gallons sap per tap	8.9	8.4	8.4
Cost	\$11.33	\$ 9.19	\$ 9.59
Value of sap	<u>5.77</u>	<u>6.32</u>	<u>6.29</u>
Gain	-\$ 5.56	-\$ 2.87	-\$ 3.30

SOUTHWESTERN AREA

The 23 producers who were visited in Southwestern New York had from 380 to 6,200 taps and produced from 3,100 to 61,300 gallons of maple sap.

Labor Use

In the area the farmers who were visited used somewhat more tubing than in the North. The pattern of use of labor was similar for both the farmers with large and small enterprises except that those with the large businesses spent somewhat less time, relatively, in harvesting and more for other activities (Table 10). This is to be expected since the amount of sap harvested was somewhat greater per tree on the farms with the smaller enterprises.

Table 10. LABOR USED PER FARM
IN PRODUCING MAPLE SAP
23 Producers in Southwestern New York, 1969

Item	Average for producers with:				Average	
	Less than 2000 taps	2000 taps or more			for all producers	
Number of producers	17	6			23	
Number of taps	1,107	3,900			1,836	
Gallons of sap: per producer	13,614	37,467			19,836	
per tap	12.3	9.6			10.8	
	Hours	Percent	Hours	Percent	Hours	Percent
Opening & starting	4	2	29	5	10	3
Tapping for: buckets	26	12	96	15	44	14
tubing	35	16	99	16	52	16
Gathering (buckets)	102	48	250	40	141	44
Hauling sap: buckets	1	*	2	*	1	*
tubing	7	3	9	1	8	2
Checking tubing	2	1	5	1	3	1
Take down & clean: buckets	24	11	61	10	33	10
tubing	14	7	54	8	25	8
Miscellaneous	<u>1</u>	<u>*</u>	<u>23</u>	<u>4</u>	<u>7</u>	<u>2</u>
Total	216	100	628	100	324	100

* Less than 1 percent

On a per 100 tap basis the larger enterprises were operated more efficiently than were the smaller ones (Table 11). The differences were not as great as was the case in the North but they were significant. Generally, the farmers with the bigger maple business were as efficient, or more so, in all activities connected with the sap production than were their neighbors. They spent less time in gathering and hauling sap. This, however, cannot be counted as an advantage for they produced less sap.

When the amount of sap produced is considered by putting the labor usage on a per 100 gallon of sap basis, the farmers with the largest enterprises actually used slightly more labor. This was because the overhead labor of getting started and closing down was not spread over sufficient production.

Table 11. LABOR USED PER 100 TAPS
IN PRODUCING MAPLE SAP
23 Producers in Southwestern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	17	6	23
Number of taps per producer	1,107	3,900	1,836
	- Hours -		
Opening & starting	0.4	0.7	0.6
Tapping for: buckets	2.4	2.5	2.4
tubing	3.2	2.5	2.8
Gathering (buckets)	9.2	6.4	7.7
Hauling sap: buckets	*	0.1	*
tubing	0.7	0.2	0.4
Checking tubing	0.2	0.1	0.2
Take down & clean: buckets	2.1	1.6	1.8
tubing	1.3	1.4	1.3
Miscellaneous	<u>0.1</u>	<u>0.6</u>	<u>0.4</u>
Total	19.6	16.1	17.6
Total per 100 gallons of sap	1.6	1.7	1.6

* Less than 1 percent

Costs and Returns

In the Southwest there seemed to be little gain, costwise, in having the larger enterprises (Table 12). The equipment costs per farm appeared to be higher than might be expected. Although the returns per farm were much higher because of the size of the enterprise, the costs were higher too and there was a greater loss.

Table 12. AVERAGE COSTS AND RETURNS
PER PRODUCER OF MAPLE SAP
23 Producers in Southwestern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	17	6	23
Taps per producer	1,107	3,900	1,836
Gallons of sap per producer	13,614	37,467	19,836
Maple stand	\$ 124	\$ 393	\$ 194
Equipment	386	1,655	717
Labor	469	1,451	725
Tractor, truck, horses	80	225	118
Supplies	16	47	24
Interest & overhead	49	177	83
Total cost	\$1,124	\$3,948	\$1,861
Value of sap	782	2,069	1,118
Gain	-\$ 342	-\$1,879	-\$ 743
Return per dollar of cost	\$.69	\$.53	\$.60
Return per hour of labor	\$.59	-\$.36	-\$.06

The cost per 100 taps was about the same in the Southwest for the large and the small enterprises (Table 13). The savings in labor were offset by higher equipment costs. The smaller amount of sap produced per tap hole resulted in lower income and a greater loss per 100 taps for the farmers with large enterprises.

Table 13.

AVERAGE COSTS AND RETURNS
PER 100 TAPS IN PRODUCING MAPLE SAP
23 Producers in Southwestern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	17	6	23
Taps per producer	1,107	3,900	1,836
Maple stand	\$ 11.21	\$ 10.09	\$ 10.59
Equipment	34.85	42.42	39.04
Labor	42.39	37.20	39.52
Tractor, truck, horses	7.21	5.77	6.41
Supplies	1.42	1.21	1.30
Interest & overhead	<u>4.48</u>	<u>4.55</u>	<u>4.52</u>
Total	\$101.56	\$101.24	\$101.38
Value of sap	<u>70.70</u>	<u>53.07</u>	<u>60.93</u>
Gain	-\$ 30.86	-\$ 48.17	-\$ 40.45

The costs and returns per 100 gallons of sap reflect the observations noted above. Because of their lower production the large producers had less sap over which to spread their costs and their costs per 100 gallons of sap were higher in all categories (Table 14). This was particularly true of equipment.

The large producers had costs per 100 gallons of sap that were almost twice the value of the sap produced. Their returns per 100 gallons were almost the same as for their smaller competitors but higher costs gave them losses that were almost twice those of their smaller competitors.

Table 14.

AVERAGE COSTS AND RETURNS
PER 100 GALLONS OF MAPLE SAP
23 Producers in Southwestern New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	17	6	23
Taps per producer	1,107	3,900	1,836
Gallons sap per tap	12.3	9.6	10.8
Cost	\$ 8.26	\$10.54	\$ 9.38
Value of sap	<u>5.75</u>	<u>5.53</u>	<u>5.64</u>
Gain	-\$ 2.51	-\$ 5.01	-\$ 3.74

SOUTHCENTRAL AREA

The 23 producers who were visited in Southcentral New York had from 200 to 8,000 taps and harvested from 2,800 to 77,000 gallons of maple sap.

Labor Use

The producers in Southcentral New York were somewhat more efficient than their competitors large or small in the other three maple producing areas of the State. As previously noted, more use was made of tubing and a larger proportion of the time was spent on it (Table 15).

Table 15.

LABOR USED PER FARM
IN PRODUCING MAPLE SAP
23 Producers in Southcentral New York, 1969

Item	Average for producers with:		Average			
	Less than 2000 taps	2000 taps or more	for all producers			
Number of producers	9	14	23			
Number of taps	1,011	3,834	2,730			
Gallons of sap: per producer	8,958	32,986	23,583			
per tap	8.9	8.6	8.6			
	Hours	Percent	Hours	Percent	Hours	Percent
Opening & starting	2	1	7	1	5	1
Tapping for: buckets	26	13	54	9	43	10
tubing	52	25	144	25	108	25
Gathering (buckets)	57	27	192	33	139	32
Hauling sap: buckets	3	1	---	--	1	*
tubing	24	12	52	9	41	9
Checking tubing	7	3	2	*	4	1
Take down & clean: buckets	14	7	53	9	38	9
tubing	21	10	77	13	55	12
Miscellaneous	<u>2</u>	<u>1</u>	<u>5</u>	<u>1</u>	<u>4</u>	<u>1</u>
Total	208	100	586	100	438	100

* Less than 1 percent.

On the basis of 100 taps the producers in the Southcentral area were as efficient as in other areas. In fact, the large producers were somewhat more so. The producers with larger enterprises were considerably more efficient than their smaller competitors. They used only 15 hours of labor or 25 percent less (Table 16). They spent less time in tapping and handling sap per 100 taps and produced about the same amount of sap from the taps.

Table 16. LABOR USED PER 100 TAPS
IN PRODUCING MAPLE SAP
23 Producers in Southcentral New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	9	14	23
Number of taps per producer	1,011	3,834	2,730
	- Hours -		
Opening & starting	0.2	0.2	0.2
Tapping for: buckets	2.6	1.4	1.6
tubing	5.1	3.8	4.0
Gathering (buckets)	5.7	5.0	5.1
Hauling sap: buckets	0.3	---	*
tubing	2.4	1.4	1.5
Checking tubing	0.7	*	0.1
Take down & clean: buckets	1.4	1.4	1.4
tubing	2.0	2.0	2.0
Miscellaneous	0.2	0.1	0.1
Total	20.6	15.3	16.0
Total per 100 gallons of sap	2.3	1.8	1.9

* Less than 1 percent.

The same observations and conclusions can be arrived at when the farmers are compared on the amount of labor used to produce 100 gallons of maple sap. It took less time for the farmers with the larger enterprises and they made most of their saving in the tapping and handling of sap.

As with farmers in the other areas the largest items of cost in producing maple sap were equipment and labor (Table 17). The large producers had higher total costs, returns and losses because of their size.

The farmers with small enterprises got only 51 cents return for each dollar they spent on the enterprise. They lacked 4 cents per hour of getting anything for their time. Those with larger enterprises made only 12 cents per hour after they had covered the other costs of production.

Table 17.

AVERAGE COSTS AND RETURNS
PER PRODUCER OF MAPLE SAP
23 Producers in Southcentral New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	9	14	23
Taps per producer	1,011	3,834	2,730
Gallons sap per producer	8,958	32,986	23,583
Maple stand	\$ 111	\$ 399	\$ 286
Equipment	318	1,154	827
Labor	471	1,128	871
Tractor, truck, horses	108	285	216
Supplies	16	54	39
Interest & overhead	<u>51</u>	<u>139</u>	<u>105</u>
Total cost	\$1,075	\$3,159	\$2,344
Value of sap	<u>556</u>	<u>2,099</u>	<u>1,496</u>
Gain	-\$ 519	-\$1,060	-\$ 848
Return per dollar of cost	\$.51	\$.67	\$.64
Return per hour of labor	-\$.04	\$.12	\$.05

The larger producers had about 20 percent lower costs per 100 taps (Table 18). There were minor savings on most items but the largest saving was for labor. Both the quantity of labor for 100 taps and the value per hour placed on the labor were lower for the producers with large enterprises.

The value of the sap produced per 100 taps was almost the same for the larger enterprises and, consequently, the difference in profits, or losses as is the case, is about equal to the difference in the costs of production. The producers with large enterprises lost only about half the amount per 100 taps as did those with smaller maple businesses.

Table 18.

AVERAGE COSTS AND RETURNS
PER 100 TAPS IN PRODUCING MAPLE SAP
23 Producers in Southcentral New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	9	14	23
Taps per producer	1,011	3,834	2,730
Maple stand	\$ 10.93	\$ 10.40	\$ 10.48
Equipment	31.42	30.10	30.29
Labor	46.59	29.42	31.91
Tractor, truck, horses	10.71	7.44	7.91
Supplies	1.61	1.41	1.44
Interest & overhead	<u>5.07</u>	<u>3.62</u>	<u>3.83</u>
Total cost	\$106.33	\$ 82.39	\$ 85.86
Value of sap	<u>55.00</u>	<u>54.74</u>	<u>54.78</u>
Gain	-\$ 51.33	-\$ 27.65	-\$ 31.08

Essentially the same conclusions can be drawn when the data are considered on the basis of the cost per 100 gallons of maple sap. The costs were somewhat less for all categories but the largest reduction was for labor (Table 19). The value of 100 gallons of sap was about the same for each group of producers and the difference in the amount of the loss per 100 gallons of sap was primarily the difference in cost.

Table 19.

AVERAGE COSTS AND RETURNS
PER 100 GALLONS OF MAPLE SAP
23 Producers in Southcentral New York, 1969

Item	Average for producers with:		Average for all producers
	Less than 2000 taps	2000 taps or more	
Number of producers	9	14	23
Taps per producer	1,011	3,834	2,730
Gallons of sap per tap	8.9	8.6	8.6
Cost	\$12.00	\$ 9.58	\$ 9.94
Value of sap	<u>6.21</u>	<u>6.37</u>	<u>6.34</u>
Gain	-\$ 5.79	-\$ 3.21	-\$ 3.60

COMPARISON OF SMALL
ENTERPRISES IN THE THREE AREAS

There was considerable similarity in the time spent and the costs of production per 100 taps among the three maple areas of New York (Table 20). However, the returns for the Southwestern area were considerably higher than for the other areas. This was primarily due to the higher yields of sap.

When the costs were computed on the basis of 100 gallons of sap produced, the costs were again similar for the Southcentral and Northern areas. They were much lower in the Southwest because of the higher yield.

Although the values placed on the sap by the small producers in the Southwest were lower than in the other areas, the lower cost resulted in a smaller loss per 100 taps or per 100 gallons of sap.

Table 20. A COMPARISON OF LABOR USED AND COSTS AND RETURNS IN PRODUCING MAPLE SAP BY OPERATORS WITH LESS THAN 2000 TAPS
33 Producers in New York, 1969

Item	Northern	Southwestern	Southcentral
Number of producers	7	17	9
Number of taps per producer	996	1,107	1,011
Gallons of sap per producer	8,886	13,614	8,958
Gallons of sap per tap	8.9	12.3	8.9
Per 100 taps -			
Hours of labor	23.3	19.6	20.6
Cost	\$101.09	\$101.56	\$106.33
Value of sap	<u>51.51</u>	<u>70.70</u>	<u>55.00</u>
Gain	-\$ 49.58	-\$ 30.86	-\$ 51.33
Per 100 gallons of sap -			
Hours of labor	2.6	1.6	2.3
Cost	\$ 11.33	\$ 8.26	\$ 12.00
Value of sap	<u>5.77</u>	<u>5.75</u>	<u>6.21</u>
Gain	-\$ 5.56	-\$ 2.51	-\$ 5.79

COMPARISON OF LARGE
ENTERPRISES IN THE THREE AREAS

Generally, the farmers with large enterprises in all three of the maple areas of New York were more efficient producers than their smaller competitors. However, when the large producer enterprises are compared it is evident that in 1969 there were some marked differences (Table 21). Costs per 100 taps were considerably lower in the North and Southcentral areas than in the Southwest. The value of the sap produced was about the same. Thus, the losses were less in the low cost areas and were least in the North.

In spite of a little higher production per tap and higher total production per farm, the cost per 100 gallons of sap was highest for the producers with large enterprises in the Southwest. The returns per 100 gallons of sap were least for the large producers in that area and the farmers loss was almost equal to the value of the sap. In other areas the losses were substantial but not quite as bad.

Table 21. A COMPARISON OF LABOR USED AND COSTS AND RETURNS IN PRODUCING MAPLE SAP BY OPERATORS WITH MORE THAN 2000 TAPS
31 Producers in New York, 1969

Item	Northern	Southwestern	Southcentral
Number of producers	11	6	14
Number of taps per producer	3,877	3,900	3,834
Gallons of sap per producer	32,386	37,467	32,986
Gallons of sap per tap	8.4	9.6	8.6
Per 100 taps -			
Hours of labor	17.2	16.1	15.3
Cost	\$ 76.73	\$101.24	\$ 82.39
Value of sap	<u>52.74</u>	<u>53.07</u>	<u>54.74</u>
Gain	-\$ 23.99	-\$ 48.17	-\$ 27.65
Per 100 gallons of sap -			
Hours of labor	2.1	1.7	1.8
Cost	\$ 9.19	\$ 10.54	\$ 9.58
Value of sap	<u>6.32</u>	<u>5.53</u>	<u>6.37</u>
Gain	-\$ 2.87	-\$ 5.01	-\$ 3.21

THE EFFECT OF
SIZE OF ENTERPRISE ON
EFFICIENCY OF PRODUCTION

Labor Use

When all of the farms on which information was obtained were considered there was a marked decrease in the amount of time spent per 100 taps in producing maple sap. Those farmers with 5,000 or more taps spent only slightly more than half as much time in the whole process as did those with less than 1,000 taps (Table 22).

However, the amount of sap produced per tap tended to decrease as the size of enterprise increased. This decrease tended to offset the decrease in hours spent on the enterprise. The resultant effect on the time spent per gallon of syrup, made the amount nearly the same for all groups except those with small numbers of taps.

Table 22. LABOR USED PER 100 TAPS
IN PRODUCING MAPLE SAP
64 PRODUCERS IN NEW YORK, 1969

Item	Average for farms with:					Average for all producers
	0-999 taps	1000-1999	2000-2999	3000-4999	5000 or more taps	
Number of producers	11	22	12	10	9	64
Number of taps per producer	500	1,336	2,261	3,370	6,544	2,416
Gallons of sap per producer	5,084	14,470	21,221	31,575	52,494	22,142
Gallons of sap per tap	10.2	10.8	9.4	9.4	8.0	9.2
- Hours -						
Opening & starting	0.2	0.4	0.1	0.2	0.4	0.3
Tapping for: buckets	4.9	2.4	2.5	1.8	1.7	2.1
tubing	1.1	3.8	2.5	3.2	2.6	2.9
Gathering (buckets)	15.2	7.9	9.4	7.6	5.7	7.5
Hauling sap: buckets	0.5	*	---	*	*	*
tubing	0.3	1.2	0.8	0.2	1.0	0.8
Checking tubing	0.1	0.3	*	0.1	0.2	0.1
Take down & clean: buckets	4.0	1.6	2.3	1.9	1.1	1.7
tubing	0.8	1.5	1.8	1.1	1.6	1.5
Miscellaneous	<u>0.1</u>	<u>0.2</u>	<u>0.2</u>	<u>0.4</u>	<u>0.1</u>	<u>0.2</u>
Total	27.2	19.3	19.6	16.5	14.4	17.1
Per 100 gallons of sap	2.7	1.8	2.1	1.8	1.8	1.9

* Less than 1 percent

Costs and Returns

When the 64 maple sap producers were sorted on the basis of number of taps there was strong evidence of the advantages of size of enterprise. Almost every category of cost was progressively less per 100 taps as size of enterprise increased (Table 23). The labor cost, particularly, decreased. Overall, the farmers with large enterprises had costs per 100 taps that were \$50 less than did those with the fewest taps.

The operators of smaller enterprises tended to have somewhat higher sap yields and this offset some of the advantage of lower cost. The higher yields also probably contributed to the higher cost.

Table 23. AVERAGE COSTS AND RETURNS PER 100 TAPS
IN PRODUCING MAPLE SAP
64 Producers in New York, 1969

Item	Average for producers with:					Average for all producers
	0-999 taps	1000- 1999 taps	2000- 2999 taps	3000- 4999 taps	5000 or more taps	
Number of producers	11	22	12	10	9	64
Number of taps per producer	500	1,336	2,261	3,370	6,544	2,416
Gallons of sap per producer	5,084	14,470	21,211	31,575	52,494	22,142
Gallons of sap per tap	10.2	10.8	9.4	9.4	8.0	9.2
Maple stand	\$ 10.96	\$10.61	\$10.63	\$ 9.02	\$ 9.86	\$ 9.99
Equipment	35.47	32.47	32.17	33.09	29.71	31.61
Labor	60.27	41.21	37.63	33.63	26.83	34.13
Tractor, truck, horses	14.42	7.77	8.01	6.20	6.60	7.26
Supplies	1.73	1.43	1.06	1.40	1.44	1.37
Interest & overhead	<u>5.40</u>	<u>4.44</u>	<u>4.07</u>	<u>3.95</u>	<u>3.39</u>	<u>3.91</u>
Total cost	\$128.25	\$97.93	\$93.57	\$87.29	\$77.83	\$88.27
Value of sap	<u>64.14</u>	<u>62.51</u>	<u>57.81</u>	<u>52.25</u>	<u>52.64</u>	<u>55.75</u>
Gain	-\$ 64.11	-\$35.42	-\$35.76	-\$35.04	-\$25.19	-\$32.52

When the costs and returns were figured on a per 100 gallons of sap basis the advantages of the higher production were more evident (Table 24). The farmers with the larger enterprises clearly had an advantage but it was evident that farmers with moderate size enterprises and good yields could produce maple sap about as cheaply as those with the larger enterprises and less favorable yields.

Table 24. AVERAGE COSTS AND RETURNS PER 100 GALLONS
IN PRODUCING MAPLE SAP
64 Producers in New York, 1969

Item	Average for farms with:					Average for all producers
	0-999 taps	1000- 1999 taps	2000- 2999 taps	3000- 4999 taps	5000 or more taps	
Number of producers	11	22	12	10	9	64
Number of taps per producer	500	1,336	2,261	3,370	6,544	2,416
Gallons of sap per producer	5,084	14,470	21,221	31,575	52,494	22,142
Gallons sap per tap	10.2	10.8	9.4	9.4	8.0	9.2
Cost	\$12.62	\$ 9.04	\$ 9.97	\$ 9.32	\$ 9.70	\$ 9.63
Value	<u>6.31</u>	<u>5.77</u>	<u>6.16</u>	<u>5.58</u>	<u>6.56</u>	<u>6.08</u>
Gain	-\$ 6.31	-\$ 3.27	-\$ 3.81	-\$ 3.74	-\$ 3.14	-\$ 3.55

TUBING AND BUCKET COSTS

One of the new developments in producing maple sap is the use of plastic tubing to carry the sap from the tree to central collection tanks or to the storage tanks or evaporator house. Among the farmers visited in this study there were 21 who used both buckets and tubing. These had about 53 percent of the taps on tubing.

There were also 31 farmers who used buckets only and 12 who used tubing only. The information from these last two groups indicated that under the circumstances which existed there was little advantage of one system over the other (Table 25). With tubing there was some savings in labor. However, the extra time spent in setting up, checking and taking down the tubing tended to offset some of the saving in sap collection.

The saving in time spent resulted in a lower cost for that item for farmers using tubing but this was offset by higher equipment (including tubing) with the result that there was no advantage cost-wise over the bucket harvesting of sap.

Table 25. COST OF MAPLE SAP PRODUCTION
WITH BUCKETS AND TUBING

Item	With Buckets Only		With Tubing Only	
	Per 100 Taps	Per 100 gal. sap	Per 100 Taps	Per 100 gal. sap
Number of producers		31		12
Number of taps per producer:				
on tubing		--		2,208
on buckets		1,775		--
Gallons of sap		16,840		19,670
Gallons sap per tap		9.5		8.9
Maple stand	\$10.83	\$ 1.06	\$ 9.81	\$ 1.15
Equipment	30.12	3.01	43.32	4.95
Labor	42.79	4.34	38.68	4.37
Tractor, truck, horses	10.75	1.09	4.10	0.47
Supplies	1.24	0.13	1.72	0.16
Other	<u>4.25</u>	<u>0.42</u>	<u>4.60</u>	<u>0.54</u>
Total cost	\$99.98	\$10.05	\$102.23	\$11.64

COSTS AND RETURNS IN SYRUP PRODUCTION

There were a total of 62 farmers from whom information was obtained about their cost of producing maple syrup (Table 26). The number in the study was 2 less than were included in the maple sap cost summaries for the simple reason that these two sold all of their maple sap production.

Table 26.

NUMBER OF MAPLE SYRUP
ENTERPRISES STUDIED BY
SIZE OF ENTERPRISE AND AREA
62 Producers New York, 1969

Gallons of syrup made	Number of farms:				All farms
	Southwestern area	Southcentral area	Northern area		
0 - 299	6	4	5		15
300 - 499	6	6	4		16
500 - 699	4	4	4		12
700 - 899	2	2	2		6
900 or more	<u>4</u>	<u>6</u>	<u>3</u>		<u>13</u>
All farms	22	22	18		62

By design there were farmers with all sizes of enterprise among the 62 syrup makers. They were studied by areas with a division between large and small producers. Overall, the farms were divided among five size categories.

THE NORTHERN AREA

In the Northern area there were records obtained on 18 farms with half of these producing fewer than 500 gallons of syrup (Table 27). The small producers averaged 275 gallons from 10,600 gallons of maple sap. It took 155 hours of time to do this and 90 hours or almost 60 percent was spent directly on the evaporating. Another 25 percent of the time was spent in getting fuel. Only 2 hours per farm was spent in selling the syrup.

The producers with 500 or more gallons of maple syrup production spent an average of 411 hours in producing 1,199 gallons of syrup from 40,138 gallons of maple sap. They spent relatively less of their time in obtaining fuel and boiling sap and more time in making products and selling.

Whereas, the producers with small enterprises boiled only their own sap, the "larger operators" purchased about 10 percent of that which they boiled.

Table 27.

LABOR USED PER FARM
IN PRODUCING MAPLE SYRUP
18 PRODUCERS, NORTHERN NEW YORK, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	9	9	18
Gallons syrup made per farm	275	1,199	737
Gallons sap boiled per farm:			
Own	10,578	35,916	23,247
Purchased	-----	4,222	2,111
Total	10,578	40,138	25,358
		- Hours -	
Obtaining fuel	39	66	52
Evaporating	90	214	152
Making products	10	63	37
Packaging	*	21	11
Selling	2	21	11
Preparation & clean up	<u>14</u>	<u>26</u>	<u>20</u>
Total	155	411	283
		- Percent -	
Obtaining fuel	25	16	18
Evaporating	58	52	54
Making products	7	16	13
Packaging	*	5	4
Selling	1	5	4
Preparation & clean up	<u>9</u>	<u>6</u>	<u>7</u>
Total	100	100	100

* Less than 1 percent

Costs of Production Per Farm

Because of the volume the total cost per farm in producing maple syrup was higher for the large enterprises than the small (Table 28). Aside from this, however, there were other significant differences. For the large enterprises the equipment costs relatively were not as high and a smaller proportion of the total was spent for labor, (whether the operator's own or hired). The farmers with large enterprises had a much higher proportion of the cost for sap, (purchased and produced) more fuel was purchased and more was spent on containers.

Table 28.

COST PER FARM FOR PRODUCING
MAPLE SYRUP
18 Producers, Northern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	9	9	18
Gallons made per farm	275	1,199	737
		- Cost -	
Buildings	\$ 109	\$ 291	\$ 200
Equipment	277	557	417
Labor	411	973	692
Sap: purchased	---	267	134
produced	603	2295	1449
Utilities	15	54	34
Fuel purchased	6	325	165
Supplies	3	57	30
Tractor, truck	13	21	17
Containers	125	634	380
Merchandising	4	36	20
Other	<u>78</u>	<u>274</u>	<u>176</u>
Total	\$1644	\$5784	\$3714
		- Percent -	
Buildings	6	5	5
Equipment	17	10	11
Labor	25	17	19
Sap: purchased	--	4	4
produced	37	40	39
Utilities	1	1	1
Fuel purchased	*	5	4
Supplies	*	1	1
Tractor, truck	1	*	*
Containers	8	11	10
Merchandising	*	1	1
Other	<u>5</u>	<u>5</u>	<u>5</u>
Total	100	100	100

* Less than 1 percent

Costs and Returns Per Farm

The costs and returns were much more favorable for the producers with the large enterprises. Those farmers received an average of \$7,669 per farm from maple products (Table 29). Their costs averaged \$5,784 leaving a gain of \$1,885 above all costs including depreciation, out of pocket costs, an allowance for the operator's time, etc.

The farmers with small enterprises by contrast made only a \$87 gain after paying all costs including labor. In considering the receipts it should be noted that the large producers received somewhat more from the sale of maple products.

The small operations returned the farmer a fair return for his time, but those with large enterprises were rewarded handsomely as shown by the return per hour of labor.

Table 29.

COST AND RETURNS PER FARM
IN PRODUCING MAPLE SYRUP
18 Producers, Northern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	9	9	18
Gallons made per farm	275	1,199	737
Returns:			
Syrup	\$1642	\$7074	\$4358
Products	<u>89</u>	<u>595</u>	<u>342</u>
Total returns	\$1731	\$7669	\$4700
Total cost	<u>1644</u>	<u>5784</u>	<u>3714</u>
Gain	\$ 87	\$1885	\$ 986
Return per hour of labor	\$3.22	\$6.96	\$5.94
Return per dollar of cost	\$1.05	\$1.33	\$1.27

Labor Per Gallon of Maple Syrup

The amount of labor spent per gallon provides a better way of evaluating the efficiency or labor usage, especially in comparing the large and the small enterprises, than does the summary of labor spent per farm in this activity. It helps to explain why the former were so much more profitable. Overall, the producers with 500 or more gallons of syrup used much less time in obtaining fuel (Table 30). This, however, was offset by greater expenditures per gallon for purchased fuel (Table 31). Much less time was spent per gallon in boiling sap but more in making products other than syrup, packaging and selling. The clean up work was spread over more syrup production and was thus less per gallon.

Overall, the farmers with large enterprises used 40 percent less labor per gallon than their competitors with smaller ones. It explains, in part, the higher labor return for the large enterprises.

Table 30.

LABOR USED PER GALLON
IN PRODUCING MAPLE SYRUP
18 Producers, Northern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	9	9	18
Gallons of sap boiled per gallon of syrup:			
Own	39	30	32
Purchased	--	<u>4</u>	<u>3</u>
Total	39	34	35
		- Minutes -	
Obtaining fuel	8.4	3.3	4.3
Evaporating	19.6	10.7	12.4
Making products	2.2	3.2	3.0
Packaging	0.1	1.0	0.8
Selling	0.5	1.0	0.9
Preparation & clean up	<u>3.0</u>	<u>1.3</u>	<u>1.6</u>
Total	33.8	20.5	23.0

The Cost and Returns Per Gallon

Both costs and the returns were favorable for the farmers with the larger enterprises (Table 31). Buildings, equipment and labor costs were lower. The sap cost per gallon including purchased sap was slightly less. Fuel cost, as already noted, was higher.

Table 31. COSTS TO PRODUCE A GALLON
OF MAPLE SYRUP
18 Producers, Northern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	9	9	18
Gallons made per farm	275	1,199	737
Buildings	\$.40	\$.24	\$.27
Equipment	1.01	.46	.56
Labor	1.50	.81	.94
Sap: purchased	----	.22	.18
produced	2.20	1.91	1.97
Utilities	.05	.05	.05
Fuel purchased	.02	.27	.22
Supplies	.01	.05	.04
Tractor, truck	.05	.02	.02
Containers	.46	.53	.52
Merchandising	.01	.03	.03
Other	<u>.28</u>	<u>.23</u>	<u>.24</u>
Total cost	\$5.99	\$4.82	\$5.04
Returns	<u>6.31</u>	<u>6.40</u>	<u>6.38</u>
Gain	\$0.32	\$1.58	\$1.34

The selling costs consisting of containers and merchandising were higher and it should be remembered that the farmers with large enterprises spent somewhat more time in these activities.

When all of the costs are summed the average cost for the farmers with small enterprises was almost \$6.00 per gallon. The group with larger, more efficient enterprises had a cost per gallon which was \$1.18 less, averaging \$4.82. For all 18 farmers whose businesses were studied the average cost was \$5.04 per gallon.

The returns per gallon of syrup were somewhat higher for the farmers with the 500 gallon enterprises than for those with less production. This coupled with the lower cost made a difference of \$1.26 in the profit per gallon.

THE SOUTHWESTERN AREA

There were maple production records of costs and returns obtained on 22 farms in Southwestern New York. As with the other areas these were divided into groups of producers with less than 500 gallons per farm and those with 500 gallons or more.

The group with "small" enterprises produced an average of 282 gallons of syrup from 11,353 gallons of maple sap (Table 32). The group with "large" enterprises produced an average of 937 gallons of syrup from 37,618 gallons of sap. As with the large producers in the Northern area these farmers purchased a sizable quantity of sap, about 15 percent of that which was boiled.

The farmers with the large enterprises spent higher proportions of their time in getting fuel, making products, packaging and selling than their smaller competitors. They spent relatively less time in the evaporation process. The big job for farmers with both large and small enterprises was evaporating the sap.

Costs of Production Per Farm

It cost an average of \$1,921 per farm to produce the 282 gallons of syrup for those with the small enterprises (Table 33). Equipment, labor and sap were the largest categories of cost and accounted for 76 percent of the total.

As with the Northern maple syrup producers, the farmers in the Southwest with the larger enterprises spent a smaller proportion of total cost on equipment and labor than their smaller competitors. Sap costs represented a somewhat higher part of the total and more was spent to buy sap.

Table 32.

LABOR USED PER FARM
IN PRODUCING MAPLE SYRUP
22 Producers, Southwestern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	12	10	22
Gallons syrup made per farm	282	937	580
Gallons sap boiled per farm:			
Own	10,757	31,900	20,368
Purchased	<u>596</u>	<u>5,718</u>	<u>2,924</u>
Total	11,353	37,618	23,292
		- Hours -	
Obtaining fuel	15	98	53
Evaporating	114	194	150
Making products	12	87	46
Packaging	7	79	40
Selling	4	27	15
Preparation & clean up	<u>10</u>	<u>24</u>	<u>16</u>
Total	162	509	320
		- Percent -	
Obtaining fuel	11	19	17
Evaporating	70	38	47
Making products	7	17	14
Packaging	4	16	12
Selling	2	5	5
Preparation & clean up	<u>6</u>	<u>5</u>	<u>5</u>
Total	100	100	100

Table 33.

COSTS PER FARM FOR PRODUCING
MAPLE SYRUP
22 Producers Southwestern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	12	10	22
Gallons made per farm	282	937	580
- Costs -			
Buildings	\$ 135	\$ 480	\$ 292
Equipment	322	770	525
Labor	466	1194	797
Sap: purchased	43	383	197
produced	571	1841	1148
Utilities	9	38	22
Fuel purchased	113	269	184
Supplies	9	13	11
Tractor, truck	25	30	28
Containers	128	495	295
Merchandising	10	40	23
Other	90	276	175
Total	\$1921	\$5829	\$3697
- Percent -			
Buildings	7	8	8
Equipment	17	13	14
Labor	24	20	21
Sap: purchased	2	7	5
produced	30	32	31
Utilities	*	1	1
Fuel purchased	6	5	5
Supplies	*	*	*
Tractor, truck	1	*	1
Containers	7	8	8
Merchandising	1	1	1
Other	5	5	5
Total	100	100	100

* Less than 1 percent

Costs and Returns Per Farm

The farmers who sold 500 or more gallons of syrup had, of course, much higher receipts than their smaller competitors (Table 34). Many sold relatively much more maple products.

When the cost of production was subtracted the larger producers had a gain of \$1339 per farm as compared with a loss of \$6 for their smaller competitors. The return per hour of labor for all farmers averaged \$4.38. It was \$4.98 for the farmers with large enterprises and only \$2.83 for those with small ones. The larger enterprise group had returns that exceeded expenses by 23 cents on the dollar. The farms with the small enterprises lacked less than a cent per dollar in covering their costs.

Table 34.

COSTS AND RETURNS PER FARM IN PRODUCING MAPLE SYRUP 22 Producers, Southwestern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	12	10	22
Gallons made per farm	282	937	580
Returns:			
Syrup	\$1754	\$5299	\$3366
Products	161	1869	937
Total returns	\$1915	\$7168	\$4303
Total cost	1921	5829	3697
Gain	-\$ 6	\$1339	\$ 606
Return per hour of labor	\$2.83	\$4.98	\$4.38
Return per dollar of cost	\$1.00	\$1.23	\$1.16

Labor Used Per Gallon of Syrup

In the Southwest the farmers worked about the same amount of time in producing a gallon of maple syrup whether they had large or small enterprises (Table 35). However, there were striking differences in the way the farmers spent their time. The operators of large enterprises used some more time per gallon in getting fuel. As with their counterparts in the North they spent much less time per gallon in boiling sap. And, again similar to the large producers of the Northern area, they spent more time in making products, packaging and selling. They were able to spread their farm clean up and preparation time over more gallons and thus had less time per gallon for these activities.

Table 35.

LABOR USED PER GALLON
IN PRODUCING MAPLE SYRUP
22 Producers, Southwestern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	12	10	22
Gallons of sap boiled per gallon of syrup:			
Own	38	34	35
Purchased	<u>2</u>	<u>6</u>	<u>5</u>
Total	40	40	40
		- Minutes -	
Obtaining fuel	3.2	6.3	5.5
Evaporating	24.2	12.4	15.5
Making products	2.7	5.5	4.8
Packaging	1.6	5.1	4.1
Selling	0.8	1.7	1.5
Preparation and clean up	<u>2.1</u>	<u>1.6</u>	<u>1.7</u>
Total	34.6	32.6	33.1

Costs and Returns Per Gallon

The total cost of producing a gallon of maple syrup averaged \$6.22 for the farmers with large enterprises in the Southwest. This was 59 cents less than for farmers with smaller enterprises (Table 36). The former had a little higher building costs and spent considerably more for maple sap. They had lower costs per gallon for equipment and labor.

The most significant difference was in the returns which were \$7.65 per gallon for the 10 farms which sold 500 gallons of syrup or more and were \$6.79 for the other group.

The combination of lower costs and higher returns gave the farmers with large enterprises a handsome \$1.43 per gallon profit after covering all costs; whereas, their less efficient neighbors had a loss per gallon of 2 cents.

Table 36.

COST TO PRODUCE A GALLON
OF MAPLE SYRUP
22 Producers, Southwestern New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	12	10	22
Gallons made per farm	282	937	580
Buildings	\$.48	\$.51	\$.50
Equipment	1.14	.82	.91
Labor	1.65	1.27	1.37
Sap: purchased	.15	.41	.34
produced	2.03	1.97	1.98
Utilities	.03	.04	.04
Fuel purchased	.40	.29	.32
Supplies	.04	.01	.02
Tractor, truck	.09	.03	.05
Containers	.45	.53	.51
Merchandising	.03	.04	.04
Other	<u>.32</u>	<u>.30</u>	<u>.30</u>
Total cost	\$6.81	\$6.22	\$6.38
Returns	<u>6.79</u>	<u>7.65</u>	<u>7.42</u>
Gain	-\$.02	\$1.43	\$1.04

THE SOUTHCENTRAL AREA

In the Southcentral area the farms that were studied were just slightly larger than in the other two areas but there were many similarities in the costs and returns.

The 10 farmers who produced less than 500 gallons of syrup had an average of 319 gallons per farm from 12,758 gallons of maple sap (Table 37). They spent 165 hours in the process. The farmers purchased about 20 percent of the sap which they boiled. About 58 percent of their time was spent in boiling sap.

The 12 farmers with large enterprises boiled 1,373 gallons of syrup from 45,350 gallons of sap. They spent 638 hours in syrup production and sales. They bought nearly 1/4 of the sap which they boiled.

The use of labor contrasted markedly with that of their smaller neighbors but followed a similar pattern to that of their "large" counterparts in each of the other two regions. They spent less of their total time in boiling sap and considerably more, relative to the total, in producing maple products, packaging and selling.

Cost Per Farm

It cost \$1,989 to produce 319 gallons of syrup for the "small" maple enterprises (Table 38). The costs for buildings, equipment, labor and sap made up 80 percent of the total.

The producers with large enterprises spent an average of \$8,199 to produce 1,373 gallons of syrup. Their building costs were, relative to the total, a little higher than their smaller competitors. Equipment and labor costs made up a smaller part of their total cost and relatively more was spent on fuel, containers and merchandising.

Table 37.

LABOR USED PER FARM
IN PRODUCING MAPLE SYRUP
22 Producers, Southcentral New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	10	12	22
Gallons syrup made per farm	319	1,373	894
Gallons sap boiled per farm:			
Own	10,438	34,742	23,694
Purchased	<u>2,320</u>	<u>10,608</u>	<u>6,841</u>
Total	12,758	45,350	30,535
		- Hours -	
Obtaining fuel	14	38	27
Evaporating	95	248	178
Making products	20	196	116
Packaging	13	74	46
Selling	10	51	33
Preparation & clean up	<u>13</u>	<u>31</u>	<u>23</u>
Total	165	638	423
		- Percent -	
Obtaining fuel	8	6	6
Evaporating	58	39	42
Making products	12	31	27
Packaging	8	11	11
Selling	6	8	8
Preparation & clean up	<u>8</u>	<u>5</u>	<u>6</u>
Total	100	100	100

Table 38.

COST PER FARM FOR PRODUCING
MAPLE SYRUP
22 Producers, Southcentral New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	10	12	22
Gallons made per farm	319	1,373	894
		- Cost -	
Buildings	\$ 110	\$ 732	\$ 449
Equipment	289	959	654
Labor	454	1226	875
Sap: purchased	156	807	511
produced	558	2260	1486
Utilities	20	46	34
Fuel purchased	126	640	407
Supplies	8	28	19
Tractor, truck	9	26	18
Containers	148	929	574
Merchandising	14	152	90
Other	<u>97</u>	<u>394</u>	<u>259</u>
Total	\$1989	\$8199	\$5376
		- Percent -	
Buildings	6	9	8
Equipment	15	12	12
Labor	23	15	16
Sap: purchased	8	10	9
produced	28	27	28
Utilities	1	1	1
Fuel purchased	6	8	8
Supplies	*	*	*
Tractor, truck	*	*	*
Containers	7	11	11
Merchandising	1	2	2
Other	<u>5</u>	<u>5</u>	<u>5</u>
Total	100	100	100

* Less than 1 percent

Costs and Returns Per Farm

The total sales of products by the farmers with small enterprises averaged \$1969 and lacked \$20 of covering the costs (Table 39). The larger producers sold an average of \$10,398 worth of maple syrup and other products and made a gain of \$2199 after meeting their costs. This latter group sold about 30 percent of their production in the form of maple products other than syrup.

The contrast between the large and small enterprises is emphasized in the measures showing labor returns and profits. The farmers with large enterprises received \$5.37 for each hour that was spent on the maple syrup producing activity and received a return of \$1.27 for each \$1.00 that was spent in the process. Those with small enterprises made \$2.64 per hour and lacked 1 cent on the dollar of covering costs.

Table 39. COSTS AND RETURNS PER FARM
IN PRODUCING MAPLE SYRUP
22 Producers, Southcentral New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	10	12	22
Gallons made per farm	319	1373	894
Returns:			
Syrup	\$1790	\$7320	\$4806
Products	179	3078	1760
Total returns	\$1969	\$10398	\$6566
Total cost	1989	8199	5376
Gain	-\$ 20	\$ 2199	\$1190
Return per hour of labor	\$2.64	\$ 5.37	\$4.88
Return per dollar of cost	\$0.99	\$ 1.27	\$1.22

Labor Use Per Gallon

In the Southcentral area it took the producers with large enterprises about 28 minutes of time and 33 gallons of sap to produce a gallon of syrup or the equivalent in maple products (Table 40). Their small competitors in the area used 31 minutes and 40 gallons of sap for a gallon of syrup. The "larger" producers spent less time per gallon in boiling and more time in making other products, packaging and selling. Their volume enabled them to spread their clean up and preparation time and spend a smaller amount per gallon of syrup.

Table 40.

LABOR USED PER GALLON
IN PRODUCING MAPLE SYRUP
22 Producers, Southcentral New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	10	12	22
Gallons of sap boiled per gallon of syrup:			
Own	33	25	26
Purchased	<u>7</u>	<u>8</u>	<u>8</u>
Total	40	33	34
		- Minutes -	
Obtaining fuel	2.7	1.7	1.8
Evaporating	17.8	10.9	12.0
Making products	3.7	8.6	7.8
Packaging	2.4	3.2	3.1
Selling	1.9	2.2	2.2
Preparation & clean up	<u>2.5</u>	<u>1.3</u>	<u>1.5</u>
Total	31.0	27.9	28.4

Costs and Returns Per Gallon

Farmers with large enterprises in the Southcentral area had costs of production for maple syrup that averaged \$5.97 per gallon and were 26 cents less than for those with small maple syrup producing businesses (Table 40). Their building costs were higher but they had lower costs per gallon for equipment, labor and sap. They spent more on containers and merchandising.

Table 41.

COST TO PRODUCE A GALLON
OF MAPLE SYRUP
22 Producers, Southcentral New York, 1969

Item	Average for farms with:		Average for all farms
	Less than 500 gallons syrup production	500 gallons syrup production or more	
Number of producers	10	12	22
Gallons made per farm	319	1,373	894
Buildings	\$.34	\$.53	\$.50
Equipment	.90	.70	.73
Labor	1.42	.89	.98
Sap: purchased	.49	.59	.57
produced	1.75	1.65	1.67
Utilities	.06	.03	.04
Fuel purchased	.40	.46	.46
Supplies	.03	.02	.02
Tractor, truck	.03	.02	.02
Containers	.46	.68	.64
Merchandising	.05	.11	.10
Other	<u>.30</u>	<u>.29</u>	<u>.29</u>
Total cost	\$6.23	\$5.97	\$6.02
Returns	<u>\$6.17</u>	<u>\$7.57</u>	<u>\$7.35</u>
Gain	-\$.06	\$1.60	\$1.33

The biggest difference between the two groups and the one that affected profits most was the difference in returns. The farmers with large enterprises sold their syrup and products for an average of \$7.57 per gallon. This was \$1.40 more than for the farmers with small enterprises.

The farmers with large enterprises enjoyed a profit of \$1.60 per gallon of maple syrup or the equivalent of maple products. This is in contrast to a loss of 6 cents for the farmers with small businesses. The \$1.66 difference was due to both lower costs and higher returns per gallon, but mostly to the latter.

COMPARISON OF LARGE AND SMALL ENTERPRISES

For all areas there was a surprising similarity among both the farms with the small and the large enterprises and differences between the two (Table 42).

Labor Use Per Gallon of Syrup For Large and Small Enterprises

Generally, the total amount of time spent per gallon was less for the large enterprises. The time spent in evaporating the sap for a gallon of syrup was considerably less. There was more time spent in making products other than syrup. More time was spent per gallon of syrup in packaging. More time was spent per gallon in selling syrup and other maple products by the operators of large enterprises. Less time was spent per gallon in preparation and clean up even though more than twice as much total time was spent per farm in these activities.

Table 42.

LABOR USED IN PRODUCING
A GALLON OF MAPLE SYRUP
ON FARMS WITH LARGE AND SMALL ENTERPRISES

Item	For farms in:		
	Northern area	Southwestern area	Southcentral area
Less than 500 gallons production		SMALL	
Number of farms	9	12	10
Gallons syrup per farm	275	282	319
		- Minutes -	
Obtaining fuel	8.4	3.2	2.7
Evaporating	19.6	24.2	17.8
Making products	2.2	2.7	3.7
Packaging	0.1	1.6	2.4
Selling	0.5	0.8	1.9
Preparation & clean up	<u>3.0</u>	<u>2.1</u>	<u>2.5</u>
Total	33.8	34.6	31.0
500 gallons production or more		LARGE	
Number of farms	9	10	12
Gallons syrup per farm	1199	937	1373
		- Minutes -	
Obtaining fuel	3.3	6.3	1.7
Evaporating	10.7	12.4	10.9
Making products	3.2	5.5	8.6
Packaging	1.0	5.1	3.2
Selling	1.0	1.7	2.2
Preparation & clean up	<u>1.3</u>	<u>1.6</u>	<u>1.3</u>
Total	20.5	32.6	27.9

Costs and Returns Per Gallon of Syrup for Large and Small Enterprises

In considering the costs and returns for farms with large and small maple enterprises (as measured by gallons of syrup produced) several points are noteworthy (Tables 43 and 44).

The small enterprises in all areas made little or no profit per gallon of syrup.

Equipment costs were lower per gallon for large enterprises than the small in all areas even though the total for the enterprise was much higher. The labor cost per gallon was considerably lower. Although the sap cost was quite similar for all sizes of enterprises in all areas, the producers with large enterprises spent more per gallon for containers; they had lower costs of production per gallon; they spent more on merchandising and spent more time in making maple products and selling. The latter added to the labor cost but should be considered as selling or promotion expense.

Farmers with large enterprises had appreciably higher returns per gallon of syrup or syrup equivalent and those in the Southwest and Southcentral area received a considerably higher proportion of their income from maple products other than syrup.

Farmers with small enterprises "made wages" or a little less for their time in boiling sap, whereas, those with large maple syrup producing enterprises were paid handsomely for their time in all areas. To look at it another way, the farmers made wages and a good return on the money invested in the production activity.

Table 43.

COSTS AND RETURNS PER GALLON
FOR FARMS PRODUCING LESS THAN
500 GALLONS OF SYRUP
31 Producers, New York, 1969

Item	Northern area	Southwestern area	Southcentral area
Costs:			
Buildings	\$.40	\$.48	\$.34
Equipment	1.01	1.14	.90
Labor	1.50	1.65	1.42
Sap: purchased	----	.15	.49
produced	2.20	2.03	1.75
Utilities	.05	.03	.06
Fuel purchased	.02	.40	.40
Supplies	.01	.04	.03
Tractor, truck	.05	.09	.03
Containers	.46	.45	.46
Merchandising	.01	.03	.05
Other	<u>.28</u>	<u>.32</u>	<u>.30</u>
Total cost	\$5.99	\$6.81	\$6.23
Returns:			
Syrup	\$5.98	\$6.22	\$5.61
Maple products	<u>.33</u>	<u>.57</u>	<u>.56</u>
Total returns	<u>\$6.31</u>	<u>\$6.79</u>	<u>\$6.17</u>
Gain	\$.32	-\$.02	-\$.06
Return per hour of labor	\$3.22	\$2.83	\$2.64
Return per dollar of cost	\$1.05	\$1.00	\$.99

Table 44.

COSTS AND RETURNS PER GALLON
FOR FARMS PRODUCING 500 OR
MORE GALLONS OF SYRUP
31 Producers, New York, 1969

Item	Northern area	Southwestern area	Southcentral area
Costs:			
Buildings	\$.24	\$.51	\$.53
Equipment	.46	.82	.70
Labor	.81	1.27	.89
Sap: purchased	.22	.41	.59
produced	1.91	1.97	1.65
Utilities	.05	.04	.03
Fuel purchased	.27	.29	.46
Supplies	.05	.01	.02
Tractor, truck	.02	.03	.02
Containers	.53	.53	.68
Merchandising	.03	.04	.11
Other	<u>.23</u>	<u>.30</u>	<u>.29</u>
Total cost	\$4.82	\$6.22	\$5.97
Returns:			
Syrup	\$5.90	\$5.66	\$5.33
Maple products	<u>.50</u>	<u>1.99</u>	<u>2.24</u>
Total returns	<u>\$6.40</u>	<u>\$7.65</u>	<u>\$7.57</u>
Gain	\$1.58	\$1.43	\$1.60
Return per hour of labor	\$6.96	\$4.98	\$5.37
Return per dollar of cost	\$1.33	\$1.23	\$1.27

RELATION OF SIZE TO LABOR USE AND COSTS AND RETURNS

To further study the relation of size of enterprise to efficiency of production all 62 farms on which data were obtained on the maple syrup enterprise were divided into 5 groups according to the number of gallons of syrup which were produced.

Labor Use

The principal use of labor in producing maple syrup from sap on all farms, regardless of size of enterprise is evaporating (Table 45). However, the proportion of the time devoted to making products, packaging and selling increased as the size of enterprise increased.

Generally speaking the amount of time required to produce a gallon of maple syrup or the equivalent in maple products decreased as the size of enterprise increased. The cleanup and preparation time also showed a similar relationship.

Other activities in the maple production and selling business were increased and offset some of the saving in evaporation time. These were the making of products, packaging and selling.

Costs and Returns

There was a general trend downward in the cost of producing a gallon of maple syrup or its equivalent in maple products as size of enterprise increased. However, this was not a consistent pattern (Table 46).

Although the farmers with large enterprises had lower labor costs per gallon, part of this was offset by a tendency to purchase more fuel, to spend more on containers and to do more advertising, etc. There also was some tendency for the building cost to be higher for the larger farms.

The greater emphasis on selling activities by the farmers with the larger maple businesses is shown by the labor used and the higher costs for containers. The merchandising paid off well. The returns per gallon of syrup and equivalent maple products showed a strong tendency to go up with size and the profit per gallon showed a consistent strong positive relationship (Table 47). The return per hour of labor and return per dollar of cost were even more striking in their positive relationship with the size of the enterprise.

Table 46.

COST TO PRODUCE A GALLON
OF MAPLE SYRUP IN RELATION TO SIZE OF ENTERPRISE
62 Producers in New York, 1969

Item	Average for farms with gallons of syrup production of:					Average for all farms
	0-299	300-499	500-699	700-899	900-more	
Number of producers	15	16	12	6	13	62
Gals. syrup per farm	184	393	601	773	1,907	737
Buildings	\$.54	\$.35	\$.31	\$.48	\$.49	\$.43
Equipment	1.35	.88	.62	.93	.62	.73
Labor	1.87	1.38	1.24	1.15	.85	1.08
Sap: purchased	.11	.28	.13	----	.60	.39
produced	2.10	1.92	2.21	2.23	1.61	1.84
Utilities	.05	.05	.03	.02	.04	.04
Fuel purchased	.34	.27	.18	.40	.41	.35
Supplies	.02	.03	.02	*	.03	.03
Tractor, truck	.13	.02	.03	.01	.02	.03
Containers	.49	.44	.42	.50	.66	.57
Merchandising	.03	.04	.07	.04	.08	.06
Other	<u>.34</u>	<u>.29</u>	<u>.26</u>	<u>.30</u>	<u>.27</u>	<u>.28</u>
Total cost	\$7.37	\$5.95	\$5.52	\$6.06	\$5.68	\$5.83

* Less than 1 percent.

Table 47.

COSTS AND RETURNS PER
GALLON OF MAPLE SYRUP MADE
62 Producers in New York, 1969

Item	Average for farms with gallons of syrup production of:					Average for all farms
	0-299	300-499	500-699	700-899	900-more	
Number of producers	15	16	12	6	13	62
Gallons syrup per farm	184	393	601	773	1,879	737
Returns	\$6.68	\$6.33	\$6.17	\$6.88	\$7.63	\$7.09
Cost	<u>7.37</u>	<u>5.95</u>	<u>5.52</u>	<u>6.06</u>	<u>5.68</u>	<u>5.83</u>
Gain	-\$.69	\$.38	\$.65	\$.82	\$1.95	\$1.26
Return per hour	\$1.84	\$3.45	\$3.61	\$4.15	\$6.63	\$4.97
Return per dollar of cost	\$0.91	\$1.06	\$1.12	\$1.14	\$1.34	\$1.21

PROFITS FROM THE
COMBINED MAPLE SAP
AND SYRUP PRODUCTION

There were 62 farmers who produced both maple sap and syrup (Table 48). Some of these sold part of the sap they produced and "boiled" the rest. Others bought sap from other farmers and made syrup from both their own production and the sap which they bought.

Generally speaking, the maple sap and syrup production with small enterprises was not profitable. Only one of the 15 producers of small amounts of syrup, i.e., less than 300 gallons made a profit on sap production. Four profited from their syrup business. But when the profits from both activities were considered there was only one farmer who made a profit overall.

As the size of the enterprise increased the situation was more favorable. Of the 13 farmers who provided 900 or more gallons of maple syrup not one made a profit on his maple sap enterprise. There were, however, 12 of the group who profited on their maple syrup production activity. When the two activities are combined the losses in the sap production offset some of the gains from the syrup production. Overall, for the farms with large enterprises 8 of the 13 showed a profit.

Table 48. MAPLE SAP AND SYRUP PROFITS RELATED TO SIZE OF ENTERPRISE
62 Producers, Three Regions, New York, 1969

Size of Enterprise (gal. of syrup)	Region	Number of producers	Own Sap Produced		Syrup produced gallons	Enterprise profits from		Total operation	Number of producers showing a profit on		
			Gal.	Percent of total processed		Sap	Syrup		Sap	Syrup	Overall
299 or less	N	5	7,240	100	190	\$- 389	\$+ 111	\$- 278	1	3	1
	SC	4	6,295	97	156	- 460	- 138	- 598	0	0	0
	SW	6	7,592	93	198	- 564	- 317	- 881	0	1	0
	All	15							1	4	1
300-499	N	4	14,750	100	380	-1,104	+ 57	-1,047	0	2	0
	SC	6	13,200	78	428	- 578	+ 60	- 518	0	4	1
	SW	6	13,923	96	366	- 625	+ 305	- 320	0	5	2
	All	16							0	11	3
500-699	N	4	23,000	100	612	- 535	+ 378	- 157	0	3	1
	SC	4	21,625	93	612	- 843	+ 541	- 302	0	4	1
	SW	4	22,450	92	578	- 105	+ 248	- 143	2	2	3
	All	12							2	9	5
700-899	N	2	28,625	100	795	-1,344	+1,241	- 103	0	2	1
	SC	2	25,750	100	762	-1,208	+ 80	-1,128	0	1	0
	SW	2	29,250	100	760	- 753	+ 586	- 167	1	1	1
	All	6							1	4	2
900 or more	N	3	58,000	82	2,250	- 834	+4,324	+3,490	0	3	3
	SC	6	46,483	70	2,083	-1,289	+4,010	+2,721	0	5	2
	SW	4	42,675	77	1,384	-1,976	+2,807	+ 831	0	4	3
	All	13							0	12	8

THE TEN MOST PROFITABLE MAPLE SAP PRODUCERS

Actually there were only 4 maple sap producers in the study whose sap enterprises were profitable, therefore, for this comparison, six other "least loss" farms were used. These farmers had about 30 percent more taps per farm than the average (Table 49). They had a similar proportion of taps on tubing. They had a 10 percent higher production of sap per tap.

Table 49.

PHYSICAL INFORMATION IN
PRODUCING MAPLE SAP
64 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 64 producers	Average for 10 most profitable producers
	Per Producer	Per Producer
Number of farms	64	10
Number of taps	2,416	3,090
Gallons of sap	22,142	31,510
Hours per 100 gallons sap	1.9	1.4
Taps on: buckets	1,464	2,045
tubing	952	1,045
Gallons of sap per tap	9.2	10.2

Although the total hours spent on the sap enterprise was a little higher for the most profitable 10 farmers, they handled so many more taps and produced so much more sap that the relative time spent on the enterprise was low.

The ten farmers spent 3 less hours per 100 taps in producing the sap (Table 50). Most of the savings was in time spent on tubing even though they had more taps on tubing. The lower time per 100 taps and the higher production per tap enabled a savings of 25 percent on time spent per 100 gallons of sap.

Table 50.

LABOR USE IN PRODUCING
MAPLE SAP
64 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 64 producers		Average for 10 most profitable producers	
	Per Farm	Per 100 Taps	Per Farm	Per 100 Taps
			- Hours -	
Opening & starting	6.9	0.3	0.8	*
Tapping for: buckets	50.9	2.1	61.7	2.0
tubing	70.1	2.9	47.2	1.5
Gathering (buckets)	181.1	7.5	228.5	7.4
Hauling sap: buckets	0.8	*	---	---
tubing	19.7	0.8	22.3	0.7
Checking tubing	3.5	0.1	---	---
Take down & clean: buckets	40.8	1.7	45.2	1.5
tubing	35.7	1.5	26.1	0.8
Miscellaneous	4.5	0.2	4.5	0.2
Total	414.0	17.1	436.3	14.1
			- Percent -	
Opening & starting	2	2	**	**
Tapping for: buckets	12	12	14	14
tubing	17	17	11	11
Gathering (buckets)	44	44	52	52
Hauling sap: buckets	*	*	--	--
tubing	5	5	5	5
Checking tubing	1	*	--	--
Take down & clean: buckets	10	10	11	11
tubing	8	9	6	6
Miscellaneous	1	1	1	1
Total	100	100	100	100

* Less than .1 hours

** Less than 1 percent

The costs per 100 taps for the 10 farmers were \$12.86 lower than the average (Table 51). This was the result mostly of labor savings and lower equipment costs. The returns were higher per 100 taps in part because of the higher sap yields and in part because of a slightly higher value placed on the sap. In spite of the lower costs and higher returns the enterprises did not generate any profit.

Table 51. COSTS AND RETURNS IN PRODUCING MAPLE SAP
64 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 64 producers		Average for 10 most profitable producers	
	Per Farm	Per 100 Taps	Per Farm	Per 100 Taps
Cost:				
Maple stand	\$ 241	\$ 9.99	\$ 328	\$10.63
Equipment	764	31.61	859	27.80
Labor	825	34.13	756	24.47
Tractor, truck, horses	175	7.26	238	7.69
Supplies	33	1.37	49	1.59
Interest & overhead	94	3.91	100	3.23
Total cost	\$2132	\$88.27	\$2330	\$75.41
Value of sap	1347	55.75	2136	69.13
Gain	-\$ 785	-\$32.52	-\$ 194	-\$ 6.28
Return per dollar of cost	\$0.63	\$ 0.63	\$0.92	\$ 0.92
Return per hour of labor	-\$0.09	-\$ 0.09	\$1.29	\$ 1.29

THE TEN MOST PROFITABLE MAPLE SYRUP PRODUCERS

The ten farmers who have the most profitable maple syrup enterprises in the study made an average of 1,581 gallons of syrup or about twice the average (Table 52). They purchased a higher proportion of the sap that they boiled and produced about 1/4 more syrup per hour of labor.

Table 52. PHYSICAL INFORMATION IN PRODUCING MAPLE SYRUP
62 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 62 producers Per Producer	Average for 10 most profitable producers Per Producer
Number of producers	62	10
Gallons made	737	1,581
Gallons sap boiled: Own	22,384	38,705
Purchased	4,078	14,336
Gallons made per hour of labor	2.1	2.7

These farmers spent $6\frac{1}{2}$ minutes, or 20 percent, less time than did the average in producing a gallon of syrup (Table 53). They spent less time in getting fuel and evaporating but more time in making products and selling. This is most evident when the percentages of the total time are considered.

Table 53.

LABOR USE IN PRODUCING
MAPLE SYRUP
62 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 62 producers		Average for 10 most profitable producers	
	Per Farm	Per Gallon	Per Farm	Per Gallon
Job:	Hours	Minutes	Hours	Minutes
Obtaining fuel	43.6	3.6	29.9	1.1
Evaporating	160.6	13.1	231.9	8.8
Making products	68.1	5.5	178.7	6.8
Packaging	33.6	2.7	49.1	1.9
Selling	20.0	1.6	51.2	1.9
Preparation & clean up	19.7	1.6	36.4	1.4
Total	345.6	28.1	577.2	21.9
Job:	- Percent -			
Obtaining fuel	12	13	5	5
Evaporating	46	47	40	40
Making products	20	20	31	31
Packaging	10	10	9	9
Selling	6	5	9	9
Preparation & clean up	6	5	6	6
Total	100	100	100	100

In comparing the average costs and returns for the 10 most profitable enterprises and the average (Table 54), there was a 60 cent per gallon reduction in cost. There were savings on most of the cost inputs but no major item which was responsible for the amount. In fact, some items such as fuel, containers, and merchandising were higher for the most profitable farms.

The returns for the most profitable enterprises were considerably higher than the average for the 10 most profitable farmers. In fact, they were about $2\frac{1}{2}$ times as great. Most of the difference was due, of course, to the larger size enterprises. However, a major reason for the greater profits for these farmers was their higher returns per gallon of syrup or maple products, and this was due largely to the greater value of the products. Altogether the 10 most profitable farmers received \$8.04 a gallon for their syrup and products. This was \$1.02 more than the average. Their profit per gallon was \$2.76. They made a return of \$1.52 for each \$1.00 of cost. Their return per hour of labor was \$9.75.

Table 54. COSTS AND RETURNS IN PRODUCING MAPLE SYRUP
62 Producers and 10 Most Profitable
Producers, New York, 1969

Item	Average for 62 producers		Average for 10 most profitable producers	
	Per Farm	Per Gallon	Per Farm	Per Gallon
Costs:				
Buildings	\$ 321	\$.43	\$ 356	\$.23
Equipment	540	.73	853	.54
Labor	794	1.08	1263	.80
Sap: purchased	290	.39	1053	.67
produced	1356	1.84	2362	1.49
Utilities	30	.04	74	.05
Fuel purchased	258	.35	737	.47
Supplies	19	.03	53	.03
Tractor, truck	21	.03	18	.01
Containers	418	.57	1060	.67
Merchandising	46	.06	121	.07
Other	205	.28	397	.25
Total	\$4298	\$5.83	\$8347	\$5.28
Returns:				
Syrup	\$4165	\$5.65	\$8764	\$5.54
Products	1057	1.44	3945	2.50
Total	\$5222	\$7.09	\$12709	\$8.04
Gain	\$ 924	\$1.26	\$ 4362	\$2.76
Return per dollar of cost	\$1.21	\$1.21	\$ 1.52	\$1.52
Return per hour of labor	\$4.97	\$4.97	\$ 9.75	\$9.75

PROFITABLENESS OF THE MAPLE ENTERPRISES COMPARED
WITH OTHER NEW YORK FARM ENTERPRISES

Compared with other important enterprises in New York State as shown by cost account farm results for 1964-68, the returns from producing maple sap were unfavorable (Table 55). On the other hand, except for the enterprises of less than 300 gallons, the syrup making returns compare quite favorably with those for other farming activities.

Table 55. RELATIVE PROFITABLENESS OF NEW YORK ENTERPRISES
AND MAPLE SAP AND SYRUP PRODUCTION

Enterprise	Return per hour of labor	Return per dollar of cost
Farm Cost Accounts, 1964-68		
Apples	\$2.93	\$1.16
Sweet cherries	3.14	1.33
Sour cherries	4.10	1.41
Wheat	5.28	1.19
Corn for grain	.28	.91
Oats	2.27	.70
Hay	1.35	.95
Corn silage	2.02	.99
Cows	2.67	1.06
Maple sap, 1969		
0-999 gallons	- .14	.50
1000-1999	.30	.64
2000-2999	.10	.62
3000-4999	- .09	.60
5000 or more	.11	.68
Maple syrup, 1969		
0-299 gallons	1.84	.91
300-499	3.45	1.06
500-699	3.61	1.12
700-899	4.15	1.14
900 or more	6.63	1.34

OBSERVATIONS AND COMMENTS

1. The fact that maple syrup production in the United States and New York State has shown a consistent decline since before the turn of the century would indicate that farmers are finding other activities to be more profitable and are turning to those activities.

2. The statistics on production during the last 20 years indicate that there is no recent change in the trend of decline and, consequently, by deduction, the profits.

3. The states which are most adapted to maple production have continued in production. Those with more attractive alternatives have quit producing or reduced their production. The same is true for areas within New York State.

4. The data for this study were obtained from farmers in three areas of the State. Costs were computed using these data and New York Farm Cost Account experience of farmers who keep detailed enterprise cost records in cooperation with Cornell University. The latter provided rates for tractors, trucks, and equipment.

5. Costs were based on the assumption that the farmers were going to continue in the maple sap and syrup business. All "out-of-pocket" costs were included. Interest was included as a cost on all capital including operating capital. Allowance was made for the using up of capital items (depreciation) since these must be replaced if the business is to continue. Paid labor was included as an "out-of-pocket" cost and an allowance was made for the value of unpaid family labor including the time of the operator.

6. For most maple producers the enterprise is supplemental to other activities. In their casual consideration of the maple enterprise they may fail to allow for the value of the time spent by the operator, and for equipment and building costs for things which they already have and use for other activities, and overlook such indirect costs as interest and farm overhead. These costs may be overlooked in the short-run but must be considered in the long-run. They especially must be considered in any "commercial" venture.

Most farmers with sideline enterprises tend to consider only the obvious "out-of-pocket" costs and compare these with the gross income.

7. With lack of knowledge as to the complete costs involved in commercial production farmers may carry losses on the maple enterprise out of other activities for a time and they may work for a low rate of return for a time with the feeling that "something" is better than "nothing". But, when faced with major investment needs or when they find more profitable or pleasant returns for their time, these farmers will quit the enterprise. The enterprise then must be profitable in and of itself if it is to have a continuing future.

8. Some syrup producers would find that it would increase their efficiency and their profits if they could process a greater volume of sap. They would like to purchase quantities in addition to that which they produce. Other groups feel that efficient profitable central syrup making facilities can and ought to be established. Both of these must recognize that, if farmers are to be interested in producing sap for sale or for a central evaporator, that activity must be profitable for them.
9. In all areas maple sap production was not generally profitable. The producers with large enterprises lost less than those with few trees but neither had profitable enterprises.
10. The typical value of maple sap, allowing for differences in sugar content, was about 6.1 cents per gallon. In order for the producers, on the average, to break even, with allowances for the farmer's time and his capital, a price of about 9.7 cents would have to have been paid. This would involve an increase in price of about 60 percent.
11. Both increase in size of enterprise as measured by number of taps and yields of sap per tap had the effect of reducing the cost. To the extent that a farmer can control these, and the quality of the sap, and increase production, he can increase his profit, providing the cost of controlling these does not exceed the value of the increased production.
12. The total cost of sap production using tubing is about the same as for buckets. The labor cost is decreased but the equipment cost is enough higher to offset the savings. It should be noted that tubing and buckets have particular advantages for particular areas. For example, flat areas and scattered roadside trees do not lend themselves well to the use of tubing. On the other hand, tubing can enable the tapping of trees on hillsides which are too steep for practical use with buckets. The two methods of handling sap can be complimentary for many operators.
13. Sap production in New York is currently considerably less profitable than are most other farming activities.
14. Syrup production, using the prices for maple sap as previously noted in valuing the sap used and computing other costs in a way which would assume continuing production including the replacement of used up capital investments, was more profitable. With small enterprises of less than 500 gallons of syrup, the farmer about broke even.
15. The farmers with large maple syrup enterprises made good profits from the syrup production in all areas.
16. If the cost of sap had been increased by 60 percent, including purchases and production, or if the sap had been charged to the syrup production activity at cost, the farmers with small syrup producing enterprises would have made sizable losses. The farmers with the larger enterprises would have covered the additional cost and still have made a profit.

17. The maple syrup producers who spent more time in producing maple products and selling and more money on such things as containers and promotion, tended to have higher returns and profits. These tended to be the larger producers who spread the additional marketing costs over more units of output.

18. Maple syrup production profits compared favorably with most other agricultural activities in New York State.

19. The price of maple syrup relative to wages is much less favorable now than it was in the years prior to 1950.

20. Most maple syrup is probably consumed by those who "like" the product. For this discriminating group the demand for maple syrup is probably quite inelastic, i.e., a change in price would be accompanied by a relatively small change in the amount that the buyers will take. If this is the case it may be possible to increase profits in the industry by raising the price of syrup. This assumes that the pricing practices of the producers can be controlled or at least influenced.

21. There is almost no maple syrup marketing outside of the maple producing areas. Also, most maple syrup is sold in the season in which it is produced. There is little effort to provide a year-round supply.

22. Under present conditions it is doubtful if many small sap and small syrup producers will remain in business. Their costs are too high to even hope for prices which will enable such activities to be profitable.

23. A study of the market potential for maple syrup and maple products is in order. Some of the following information is needed about the marketing of maple syrup and maple products:

- a. The elasticity of the demand, i.e., the change in quantity taken relative to a change in price.
- b. The potential market if supplies are available the year-round.
- c. The potential market in other areas of the country.
- d. The need for and nature of advertising and other promotional activities.
- e. The possibilities for marketing on a wider scale through established speciality products brands. This would involve assured supply, quality control, attractive packaging, etc.
- f. The potential market and returns from new products and the need for product development.

AN APPRAISAL OF
THE FUTURE OF THE NEW YORK MAPLE INDUSTRY

Over the years there has been a decline in maple syrup production (and, of course, sap production). Unless changes are made this likely will continue. However, with appropriate changes the maple industry could be thriving and profitable and expand to use many more of the available maple trees in the state.

The two major changes which would benefit the industry and are needed are: (1) the development of fairly large central evaporators, private or cooperative, and (2) an increase in the rate of payment for sap to a level which will encourage sap production and sale or delivery to the central evaporators.

The seasonality of maple sap production and its high labor requirement are such that production will always be a sideline enterprise using "slack time". This means that most producers will have relatively small enterprises and these enterprises will need to be profitable if farmers are going to want to produce maple sap on a continuing, and even expanding, basis.

This study indicated that there would have to be a sizable increase in the price of sap if that enterprise were going to be profitable. A further look at the data shows that, except for the farmers with the smallest enterprises, the losses per 100 taps were of similar magnitude regardless of size of enterprise. Thus, a general increase in the price of maple sap would have a broad effect on the profitableness of this activity.

Any change in the price of sap ought to be based on the quality, particularly the sugar content, of the sap. This would enable the syrup makers to partially justify the higher price on the basis of savings in fuel and labor costs in making the syrup. For instance, a third less sap is needed to obtain the same quantity of syrup if the sap has a sugar content of 3 instead of 2 percent.

Also, the rate paid for sap might well reflect changes in prices of syrup.

What effect would an increase in price have on the profits of the maple syrup producers? How would it affect a central processor scheme? And why is a central processor scheme desirable?

Presently, the maple industry for all practical purposes supplies only the immediate area with maple syrup and maple products and then not the year around. If the industry is to bring new income into the area and not just transfer dollars from person to person in the area, a better marketing job must be done. Maple syrup and products must be sold to consumers in other areas. To do this sellers must provide regular availability, attractive packaging, quality products, etc., etc. This means that larger processing and selling organizations must develop. Small producers cannot afford the sales force, warehousing, advertising, etc., that are needed to do the job. Central evaporators and businesses having wide contacts must become a part of the maple industrial development.

Would such processors be successful? The likelihood is good. The central evaporators which are needed might well have production costs and income advantages similar to those of the most profitable 10 in the study. By any standards these are favorable.

However, can such producers afford to pay more for maple sap, as they must do if they hope to continue in the business and, perhaps, even expand to a larger scale? As noted above the increase in price if it reflects better quality sap can be partially offset by savings in costs of syrup production. With expansion in size of enterprise the total profit might well exceed that which is currently made. There also is the possibility of raising the price of the syrup and maple products to help compensate for the higher price of sap.

In summary, very major developments, primarily in the marketing and distribution of maple syrup, are needed if the industry is to have a real impact in improving the economic welfare in the "maple areas of New York". Primarily, this involves developing marketing organizations that are large enough to reach into other areas and to build up a year around supply of and demand for maple syrup and maple products. Also, it involves an assured supply of maple sap which can only be achieved if prices for sap are raised to a level which encourage production.