

# Maple Syrup Production in a Changing Environment

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This report summarizes the results from a survey conducted at the joint meeting of the North American Maple Syrup Council (NAMSC), the International Maple Syrup Institute (IMSI) and the Ontario Maple Syrup Producers Association (OMSPA) in Stratford, Ontario, October 20-23, 2010. The goal of the survey was to document respondent's experience of changes within maple syrup operations and sugar maple (*acer saccharum*) ecosystems, including potential changes to regulations, technologies and climate. The survey also focused on opportunities to adapt to these changes, particularly in the area of weather variability and climate change. In total, 33 surveys were completed. The results are presented below.

## General Information

The site location of respondent's business location was fairly equally distributed between Canada (52%) and the United States (48%). The majority of respondents (88%) identify themselves as producers, however, other parts of the industry were also represented. As producers, these individuals find themselves working within the sugar bush and therefore have a strong understanding of any potential ecosystem changes that occur over the years (Table 1).

**Table 1**

Business Location	Respondents	Industry Position	Respondents (choose all applicable)
Ontario	12	Producer	29
Quebec	2	Maple Syrup Retailer	8
Atlantic Canada	3	Maple Packer	7
USA – Northeast	8	Maple Syrup Distributor	4
USA – Southeast	1	Equipment Manufacturer	2
USA – Midwest	6	Other	6
Other	1		

In total, 76% of respondents indicated their family has been involved in the industry for more than 20 years. After being involved for more than two decades, these respondents will have a good understanding of the impacts, if any, that various changes have had on their businesses including climate

change. It will also allow them to better predict future impacts on their sugar bushes and businesses.

The majority of respondents (58%) indicated having a medium to high level of involvement with maple syrup organizations. 33% indicated having no formal involvement. By sharing knowledge and support through networking, individuals are better able to adapt to changes within their businesses to create a stronger, more resilient future (Table 2).

<b>Table 2</b>			
<b>Years in Business</b>	<b>Respondents</b>	<b>Level of Organization Involvement</b>	<b>Respondents</b>
Less than 10	3	No Formal	11
10 to 20	5	High Level	10
20 to 50	13	Medium Level	9
50 to 100	7	Low Level	3
More than 100	5		

The next table displays what respondents feel are the benefits of maple syrup industry organizations. Networking was the most common response with 85% of respondents agreeing to their benefits. The subsequent two answers were providing opportunities/learning new skills (82%) and conducting research on important topics (79%). All are important opportunities to help lower the impact of possible changes including climate change (Table 3).

<b>Table 3</b>	
<b>Benefits of Involvement With Maple Syrup Organizations</b>	<b>Respondents (choose all applicable)</b>
Provide Opportunities to Meet and Network with Other Producers	28
Provide Opportunities to Learn New Skills	27
Conduct Research on Important Topics	26
Lobby Government on Important Issues	21
Other	3

A number of different public discussions about maple syrup were seen as quite important by most respondents. The public discussion with the strongest response was 'buying local is good for communities' (70%). The health benefits of maple syrup and the environmental benefits of trees and woodlots both received 61% of the votes as quite important. The 'eat local', or 100 mile diet, was also well recognized at 58% (Table 4).

The final question in this section involved rating the importance of various reasons for involvement in the industry. The table indicates that many of the

<b>Public Discussion</b>	<b>Not at all Important</b>	<b>Somewhat Important</b>	<b>Quite Important</b>	<b>Don't Know/ NA</b>
Buying local is Good for Communities	3	5	23	0
Health Benefits of Maple Syrup	2	9	20	0
'Eat local' diet (100 mile diet)	6	3	19	3
Trees/Woodlots Have Env'tl Benefits	2	9	20	0
Trees Remove Carbon from Air	5	11	13	0

listed reasons were seen as quite important. Take note of three reasons in particular: learn new skills (70%), diversify income (55%) and meet/network with industry members (55%). These three are not only seen as important reasons for the members themselves, they are also good for adaptation. By learning new skills, diversifying their income and networking with other members of the industry they are developing opportunities to adapt their business to help withstand the effects of all types of change, including climate change (Table 5).

<b>Reasons for Involvement</b>	<b>Not at all Important</b>	<b>Somewhat Important</b>	<b>Quite Important</b>	<b>Don't Know/ NA</b>
New Skills	2	6	23	1
Meet Members	2	10	18	1
Financial Profit	3	8	18	2
Diversify Income	3	7	18	2
Get Outdoors	7	7	17	1
Legacy for Kids	9	7	13	3
Family History	13	7	10	2
Aboriginal Traditions	20	2	1	7
National Heritage	15	8	5	3
Spiritual Relationship	17	8	4	2

## **Changes in the Maple Syrup Industry**

The first question within this section asked respondents to rate the importance of the listed changes/opportunities to their maple syrup business. New rules about maple syrup food safety were seen to be the most important change overall with a unanimous 100% agreement. This was followed by proposed new rules about maple syrup grading (94%), fiscal incentives to modernize operations (85%) and continued erosion of government regulatory and advisory staff support (25%) (Table 6).

<b>Changes/ Opportunities</b>	<b>Not at all Important</b>	<b>Somewhat Important</b>	<b>Quite Important</b>	<b>Don't Know/ NA</b>
New Rules About Food Safety	0	11	22	0
Proposed New Rules About Grading	2	16	15	0
Fiscal Incentives	4	15	13	1
Continued Erosion of Government Staff	4	14	11	1

The next question focused on the importance of various changes/opportunities to the maple syrup business. Level of technology use (94%), level of bureaucracy and regulation (64%), and participation in organizations (61%) all had a high level of 'increasing' responses. 72% of respondents indicated that the number of taps within their sugar bushes have been increasing over the past 5 years. 40% indicated that access to help was decreasing (Table 7).

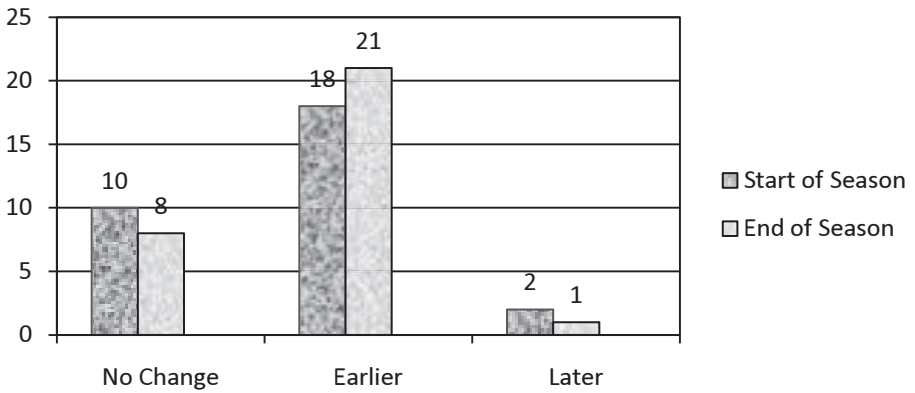
<b>Business Factor</b>	<b>Decreasing</b>	<b>No Change</b>	<b>Increasing</b>	<b>Don't Know/ NA</b>
Level of Technology	0	2	31	0
Cost	2	2	27	11
Number of Taps	1	3	24	2
Level of Bureaucracy	0	9	21	1
Participation in Organizations	0	13	20	0
Market Access	2	11	19	0
Health of Trees	4	12	14	2
Impact of Climate Change	1	10	12	9
Profit Margins	10	11	11	1
Quality of Sap	2	16	11	2
Access to Help	13	13	3	3

In thinking more specifically about climate change, the 3 most common weather patterns seen as having bad impacts on maple syrup production are change in day-time temperature (55%), change in night-time temperature (52%) and more drought-like conditions (48%) (Table 8).

<b>Weather Patterns</b>	<b>Bad Impact</b>	<b>No Impact</b>	<b>Good Impact</b>	<b>Don't Know/ NA</b>
Change in Day-time Temp	18	3	2	4
Change in Night-time Temp	17	4	2	3
More Drought Conditions	16	6	0	3
More Violent Storms	14	7	0	5
Change in Wind	11	10	1	3
Change in Snow	10	7	5	3
More Storms	7	13	0	5
Change in Rain	6	10	6	3

Figure 1 illustrates the changes noted in the timing of the season. The majority of respondents indicated the season has been both starting (55%) and ending (64%) earlier than in the past.

Table 9 lists several weather factors and shows respondent's perceptions of variability. The majority of factors were seen as becoming more variable than in the past. However, the factors that have seen the most variability were: start of season (73%), end of season (61%), day-time temperature (55%), sap production (52%) and night-time temperature (48%). Respondents were then asked to indicate the three factors that have increased the most in variability. The top responses were day-time temperature, night-time temperature, start of season and snow cover.



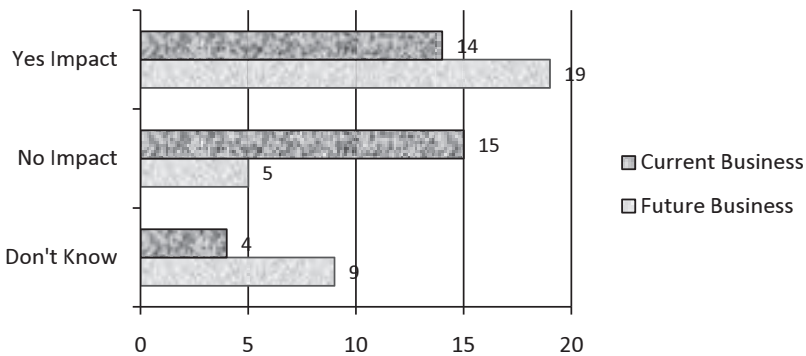
**Figure 1**

Weather Factors	Less Variable	No Change	More Variable	Don't Know/ NA
Start of Season	0	5	24	1
End of Season	2	7	20	1
Day-time Temp	2	7	18	3
Sap Quality	2	19	6	3
Night-time Temp	2	9	16	3
Snow Cover	1	12	14	3
Drought	0	15	11	4
Violence of Storms	1	15	11	3
Wind	1	17	8	4
Rain	0	18	7	5
Number of Storms	2	18	6	4
Sap Production	1	8	17	3

Figure 2 shows the results of those that believe climate change has currently had an impact on business as well as predictions of future impacts. As far as the impact on current business, 42% of respondents felt that climate change has already had an impact on their business while 45% felt it had not. Regarding the future outlook, 58% felt that climate change would have an impact on their business while only 15% of respondents felt that climate change would not affect future business. In addition, there were 27% of respondents who were unsure about the future impact. In total, 85% of the respondents believed that climate change could be a threat.

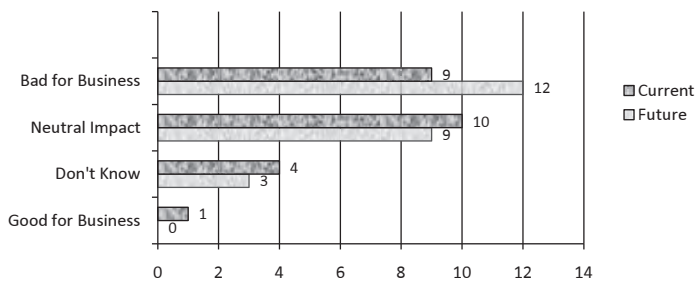
**Note: For the next three questions the population sample size decreases as only the respondents who answered 'yes' to the previous question completed them.**

The respondents were asked to indicate the impact climate change has/will have on their business currently and in the future. Out of the 24 respondents



**Figure 2**

who completed this section, 38% felt that climate change has already been bad for business. As for future concerns, 50% feel that climate change will have a bad impact (Figure 3).



**Figure 3**

For these impacts, whether seen as bad or neutral, respondents were asked if they are taking any actions in dealing with them. Although many respondents understand the concerns surrounding climate change, the majority answered 'no' to most of the actions. There were 23 respondents for this question.

Working towards understanding why some individuals are not taking a lot of action, the next question focused on the barriers. Of all the listed barriers, respondents only chose four as being applicable to their businesses: uncertainty of impacts 39%, don't know what to do 26%, lack of government policies 13%, and lack of research 35% (Table 10).

The final question asked respondents to rate their level of agreement on various statements about the maple syrup industry. The question looked at current and future trends and was answered by all but one respondent. Table 11 displays the results of the statements relating to current conditions. Combining the strongly agreed and very strongly agreed categories, 91% of respondents feel their business is currently thriving. At 53%, almost half of the respondents indicated confidence in dealing with weather changes. 44% of respondents feel concerned about the current health of their sugar bush.

Moving into the future, Table 12 shows the results of the statements focusing on the next 10 years. 91% of respondents expressed optimism for busi-

<b>Action</b>	<b>Yes</b>	<b>No</b>	<b>Barriers</b>	<b>Yes</b>	<b>No</b>
New Technology	13	10	Market Uncertainty	0	23
Active Management of Trees	11	12	Current Regulations Make it Hard to Adapt/Change	1	22
Nothing	6	17	Nothing Would Make a Difference	2	21
Reducing Carbon Emissions	4	19	Lack of Government Policies	3	20
Diversifying Business	2	21	Don't Know What to Do	6	17
Planting on Good Sites	2	21	Too Busy	6	17
Investing in Insurance Plans	1	22	Lack of Research	8	15
Planting New Maple Cultivars	1	22	Too Expensive	8	15
Reducing Involvement in Industry	1	22	Long Lifespan of Trees makes Adaptation Hard	9	14
Lobbying for Reduction of Greenhouse Gas Emissions	0	23	Uncertainty of Impacts	9	14

<b>Statement: Current Conditions</b>	<b>Very Strongly Disagree</b>	<b>Strongly Disagree</b>	<b>Neither Disagree nor Agree</b>	<b>Strongly Agree</b>	<b>Very Strongly Agree</b>	<b>Don't Know/ NA</b>
Business is Thriving	1	0	2	16	13	0
Confident in Dealing With Weather Changes	1	4	8	14	3	2
Concerned About Health of Trees	5	2	11	9	5	0

<b>Statement: Next 10 years</b>	<b>Very Strongly Disagree</b>	<b>Strongly Disagree</b>	<b>Neither Disagree nor Agree</b>	<b>Strongly Agree</b>	<b>Very Strongly Agree</b>	<b>Don't Know/ NA</b>
Optimistic Business Will Grow	0	0	2	18	11	1
Can Adapt to Climate Change (CC)	0	1	11	15	2	3
May be Negative CC Impacts Difficult to Handle	4	8	5	11	2	2

ness growth. 41% expressed concern that there may be negative climate changes they will not be able to handle. A total of 53% expressed confidence in adapting to climate change. 34% chose neither disagree nor agree.

We would like to thank everyone who participated in this survey. Your time made this project possible. Thank you!

A more complete analysis of these data is currently being published. For comments or more information, please contact the authors at the email provided at the beginning of this article.