

1998 EASTERN ONTARIO ICE STORM MAPLE PRODUCERS' SURVEY: SUMMARY AND RESULTS

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Abstract

In August, 1999, a telephone survey of maple producers in eastern Ontario was conducted in order to gather information on the changes in their operations since the 1998 ice storm. This paper presents the findings of the survey. The results will be used in a larger study to examine the economic impact of the ice storm on maple producers in this region.

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1998 Eastern Ontario Ice Storm Maple Producers' Survey: Summary and Results

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Introduction

A telephone survey of maple producers in eastern Ontario was conducted in August, 1999. This survey was a component of the Canada-Ontario agreement for the Ice Storm Economic Recovery Assistance Program. One purpose of the survey was to assess maple producers' participation in government assistance programs in order to examine the role of these programs in the restoration of damaged maple bushes and in offsetting economic losses. The survey was also used to assess the changes in syrup production since the ice storm.

Survey Design and Format

A questionnaire was developed in co-operation with the Ontario Maple Syrup Producers Research and Technology Transfer Committee, the Ontario Ministry of Agriculture Food and Rural Affairs (O.M.A.F.R.A) and the Ice Science Forest Research and Technology Transfer Group. The questionnaire included questions concerning size of the operation, production techniques used, production levels, application and approval for assistance programs, remedial actions undertaken and changes made to maple operations following the ice storm. Maple producers were also asked to report the average percent crown damage for their maple bush. Producers reported the damage rating

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as assessed by O.M.A.F.R.A technicians.⁵ If the sugarbush was not assessed by an O.M.A.F.R.A. technician, producers provided an estimate of the average percentage crown loss in their sugarbush.

The last three questions asked producers to comment on any other important impacts of the ice storm, the implementation of assistance programs and the role of the Ontario Maple Syrup Producers' Association in ice storm projects. The full questionnaire and cover letter are presented in Appendix A. The questionnaire was designed for telephone interviews and data collection sheets for research associates were also developed.

Survey Population

A phone and address list of maple producers in eastern Ontario was obtained from the Ontario Maple Syrup Producers' Association.⁶ A preliminary letter describing the survey and its role in the research project was sent to each maple producer on the address list in July, 1999. In order to interview producers from a range of damage levels, producers' addresses were categorized into one of four damage classes; Light, Light-Moderate, Moderate and Moderate-Severe according to the Canadian Forest Service map of ice storm damage to hardwoods. (The map can be found at <http://www.mnr.gov.on.ca/mnr/csb/news/feb10fs98.html>). These are broad classifications since they are based on an aerial survey. Of the 230 producers on the mailing list, 14% were in the Light category, 18% in the Light-Moderate category, 55% in the Moderate category and 13% in the Moderate-Severe category, based on the geographic location of their sugarbush.

Survey Implementation

Approximately three weeks following the preliminary letter, twenty-five producers from each of the four damage classes were randomly chosen and contacted by phone by a research associate.

⁵ Crown damage assessments were conducted by Ontario Ministry of Agriculture, Food and Rural Affairs technicians following the ice storm. These technicians gave maple bushes an overall damage rating based on the average crown loss/damage by sampling sections of the sugarbush.

⁶ The list contained addresses of 230 producers in eastern Ontario.

Producers were then asked if they had received the letter and if they would be willing to complete the phone interview, which took approximately fifteen minutes. Phone interview results were recorded on data collection sheets by research associates and were later compiled in a QuattroPro spreadsheet.

Survey Data

The percent crown damage reported by individual producers often did not correspond to the damage category based on the Canadian Forestry Service map and the geographic location of the sugarbush. This is likely because the ice storm resulted in locally variable damage. Therefore, each producer was re-categorized according to his or her reported crown damage (as determined by the O.M.A.F.R.A. tree assessment if it was conducted) into one of three classes; Light (0-25% crown damage), Moderate (26-50% damage) and Severe (51-75%).⁷ Seventeen percent of producers were in the Light category, 40% in the Moderate category, and 43% in the Severe category. One hundred producers were interviewed but three sets of responses were removed from the data set because the producers were unable to provide complete information. Data and responses were compiled into a QuattroPro spreadsheet and the data were averaged over all damage classes and for each damage class.

Survey Results

All Damage Classes

Overall, 50% of the producers that were interviewed used buckets to collect sap, 34% used a tubing system and 16% used a combination of the two systems. Sixteen producers reported damage assessments in the Light category, 38 were in the Moderate category and 40 were in the Severe

⁷ These damage groupings are consistent with other research initiatives pertaining to the 1998 ice storm and maple production.

category. Only three producers reported a damage rating greater than 75% (the Very Severe category), so this category was not analyzed.

With respect to participation in the government assistance programs, 87% of all producers had O.M.A.F.R.A. tree assessments conducted, while 65% received Eastern Ontario Disaster Relief Assistance. Twenty-nine percent of producers took part in one of the Farm Credit Corporation Loan program, the Canada-Ontario Business Recovery Assistance program, or the Forest Recovery Assistance Program (Table 1). Seventy percent of the producers surveyed used Human Resources Development Canada crews to assist in the post-storm cleanup of their sugarbushes.

Table 1: Maple Producer Participation Rates in Government Assistance Programs Following the 1998 Ice Storm

Government Assistance Program	Overall Producer Participation ¹	Participation per Operation Size Category			
		0-500 taps	500-1000 taps	1000-2000 taps	>2000 taps
<i>O.M.A.F.R.A. Tree Assessment</i>	87%	80%	70.8%	100%	94.4%
<i>Human Resources Development Canada clean-up</i>	70%	60%	58.3%	88.2%	83.3%
<i>Eastern Ontario Disaster Relief Assistance</i>	65%	62.5%	62.5%	64.7%	66.7%
<i>Forest Recovery Assistance Program</i>	13%	17.5%	4.2%	0%	27.8%
<i>Canada-Ontario Business Recovery Assistance</i>	10%	2.5%	4.2%	23.5%	22.2%
<i>Farm Credit Corporation Loan</i>	6%	0%	0%	0%	33.3%

Note: ¹Percentage of the total 97 producers that reported participating in each program.

In general, larger operations had a higher participation rate in assistance programs. One exception to this trend is for the Forest Recovery Assistance Program where 17.5% of operations with less than 500 taps accessed this assistance. The Forest Recovery Assistance Program was available to producers who had not reported income from maple production to Revenue Canada. Many small, hobby producers may not have reported their maple income because they consume the syrup themselves, or give it to neighbours and friends. Participation in the Eastern Ontario Disaster Relief Assistance program does not seem to vary greatly with operation size. This is likely due to the fact that the Eastern Ontario Disaster Relief program was the most widely available and publicized form of assistance for maple producers.

Twenty-five percent of the producers interviewed indicated that the assistance programs and government funding were essential to the recovery of their operation. Producers in this category had, on average, an operation size of 2,100 taps. Another twenty-six percent reported that the assistance was helpful and that cleanup would have taken significantly longer without it, but that they could have managed without. The average size of operation in this category was 1,400 taps. This question was subjective in that what was considered necessary assistance for recovery can vary greatly between individuals. Also, because some producers do not rely on revenue from maple production as their primary source of income, the necessity for financial assistance is lessened. Producers with larger operations would likely deem assistance necessary for their operation to recover from ice storm losses since more of their income comes from maple production.

The main management responses of maple producers in the two seasons following the ice storm were to tap fewer trees in the existing sugarbush, which 46% of producers did and to use fewer taps per tree, which 64% of producers did (Table 2). These results partly reflect the conservative tapping guidelines that O.M.A.F.R.A. recommended to producers through press releases and meetings following the ice storm. Thirty-two percent of producers responded to the damage by tapping younger trees or less-damaged trees, perhaps outside of the original sugarbush, which had not been tapped before the ice storm. In general, this was done to offset losses in production from damaged trees. Sixteen percent of the producers that were surveyed leased out

additional land for tapping in order to make up for the decrease in production in their own sugarbush. A number of operators reported arranging casual agreements with other landowners to exchange syrup for the use of their trees.

Table 2: Producers’ Management Responses in 1998 and 1999 Following the 1998 Ice Storm

Response to the Ice Storm	Percentage of Producers Reporting Activity
Fewer taps per tree	64%
Tapped fewer trees	46%
Tapped new, previously untapped trees	32%
Leased Land	16%
Change in equipment	9%

Note: Percentages taken overall 97 producers interviewed.

Producers were asked to describe the activities that they had undertaken in response to the ice storm damage. Producers made general comments on what has been done in their sugarbush and what is planned for future management following the ice storm. These responses were examined, and the different types of responses were noted and summarized in Table 3.⁸ Most producers reported cleaning up debris, thinning and pruning damaged branches and some removal of dead trees. Activities planned for the future were mainly clean up of debris for the next 2-5 years and some tree removal. A number of operators using tubing systems also reported replacing damaged lines.

⁸ There were many variations in each type of activity, such as duration of the activity and concurrent activities, so frequency of these responses was not determined.

Table 3: Producers' Responses Regarding Remedial Activities Following the Ice Storm

Remedial Action	Time Frame	Activities and Expected Benefits
Clean up of fallen limbs	1998-1999	Access to bush, safety
Tree removal and clean-up	1998- next few years	Access, thinning
Clean up, brush removal, tree marking for removal	1998-2000	Remove trees to rejuvenate bush
Clean up, thinning, pruning, thinning of new bush	1998-1999	Thinning to encourage new growth
Clean up and access	1998-next few years	Clear roadways, make the bush safe
Clean up, may do some planting	1998-1999	Trimming and thinning
Clean up, rebuild mainlines	1998-2001	Thinning, pruning, tree climbers and wood chippers hired, access
Clean-up, removal of trees, some reforestation planned	1998-2001	Reforestation to regenerate the bush
Thinning and pruning to encourage new growth	1998-ongoing	Removal of broken limbs/stems, clear roadways, encourage recovery
Clean-up, thinning, some planting	1998-on-going	Regeneration of bush to make up for lost trees
Replace lines, thinning	1998, still in process	Need to remove lines and replace

Damage Class Results

Producers were asked to estimate their production and tapping levels in a normal year, in 1998 and 1999. Therefore, the numbers reported are approximate. Production data were separated by damage class and averaged. Table 4 presents the results of this analysis. The results indicate that the reduction in average yield following the ice storm is greater as the damage level increases. Also, the average yield increased for each class from 1998 to 1999.

Table 4: Average Annual Yield of Syrup per Tap for each Damage Class in a Normal Production Year, 1998 and 1999.

Damage Class	Total Number of Taps	Number of Producers	Average Number of taps/operation	Normal Year	1998	1999
				Yield (L/tap)	Yield (L/tap)	Yield (L/tap)
Light (0-25%)	14,080	16	880	0.53	0.38	0.48
Moderate (26-50%)	45,315	38	1,225	0.74	0.40	0.63
Severe (51-75%)	64,235	40	1,605	0.92	0.36	0.61

It is not known why the average number of taps per operation increases with damage class. It may be that larger operations had trees which were managed and thinned more intensively, thus they developed larger crowns, increasing the surface area for ice accumulation and breakage.

Improvements in efficiency with larger operations tend to improve the yield, which may explain why the average yield for a normal year is greater as the number of taps per operation increases. In addition, larger operations use tubing systems more often than smaller operations, which also often results in higher average yields (North American Maple Syrup Producers Council, 1996).

Production Results According to Operation Technique

Production results were separated according to production technique; bucket, tubing or a combination of the two. The production and yield data are presented in Tables 5, 6 and 7.⁹

⁹ Producers who reported zero production for 1998 and 1999 were omitted from this analysis.

Table 5: Bucket Producers: Number of Operations in Each Damage Class, Number of Taps and Production for a Normal Year, 1998 and 1999.

Number of Operations	Damage Class		Normal Year	1998	1999
8	Light	# taps	3,290	2,110	2,404
		Volume (L)	2,873	819	1,466
		<i>L/tap</i>	<i>0.87</i>	<i>0.39</i>	<i>0.61</i>
14	Moderate	# taps	9,775	6,420	4,700
		Volume (L)	7,360	2,208	3,005
		<i>L/tap</i>	<i>0.75</i>	<i>0.34</i>	<i>0.70</i>
20	Severe	# taps	14,060	6,635	7,760
		Volume (L)	10,511	2,219	5,866
		<i>L/tap</i>	<i>0.75</i>	<i>0.33</i>	<i>0.75</i>

Table 6: Tubing Producers: Number of Operations in Each Damage Class, Number of Taps and Production for a Normal Year, 1998 and 1999.

Number of Operations	Damage Class		Normal Year	1998	1999
3	Light	# taps	3,050	3,150	3,150
		Volume (L)	1,790	1,423	1,781
		<i>L/tap¹</i>	<i>0.59</i>	<i>0.45</i>	<i>0.56</i>
11	Moderate	# taps	24,470	14,444	19,669
		Volume (L)	18,948	5,973	13,299
		<i>L/tap</i>	<i>0.77</i>	<i>0.41</i>	<i>0.68</i>
15	Severe	# taps	42,175	26,635	27,600
		Volume (L)	43,010	9,701	15,546
		<i>L/tap</i>	<i>1.02</i>	<i>0.36</i>	<i>0.56</i>

Note: ¹ Accuracy of the results for this category may be affected by the fact that only three producers are in this category.

Table 7: Combined Bucket and Tubing Producers: Number of Operations in Each Damage Class, Number of Taps and Production for a Normal Year, 1998 and 1999.

Number of Operations	Damage Class	Normal Year	1998	1999	
3	Light	# taps	840	440	440
		Volume (L)	636	239	284
		<i>L/tap</i>	<i>0.76</i>	<i>0.54</i>	<i>0.65</i>
8	Moderate	# taps	6565	4569	6939
		Volume (L)	4816	2633	4220
		<i>L/tap</i>	<i>0.73</i>	<i>0.58</i>	<i>0.61</i>
3	Severe	# taps	5300	3050	4950
		Volume (L)	4001	1082	2782
		<i>L/tap</i>	<i>0.75</i>	<i>0.35</i>	<i>0.56</i>

Yield in a normal year before the ice storm was, on average, 0.74 L/tap for producers who used a combination of tubing and bucket systems. Average normal yield for bucket producers was 0.76 L/tap, while average normal yield for tubing producers was 0.91 L/tap. These results reflect the potential improvement in yield from using a tubing system. The average size of operation with a bucket system was 650 taps, with a tubing system, 2,400 taps and with a combined system, 910 taps.

The Role of the Government, the Ontario Maple Syrup Producers' Association and Additional Comments

The last questions of the phone interview asked producers to provide any comments they had on the design and implementation of government assistance programs and the role of the Ontario Maple Syrup Producers Association in ice storm programs. Producers were also asked if they had any additional comments on the impacts of the ice storm which were not covered by the rest of the

survey. Some common responses were observed and these are presented in Tables 8, 9 and 10 along with the frequency of each response.

Regarding the government assistance programs, most producers reported that the assistance process was slow, or that the programs were beneficial. The majority of producers interviewed were pleased with the involvement of the Ontario Maple Syrup Producers' Association in ice storm programs. Very few producers had additional comments concerning the impacts of the ice storm, but those that did had concerns about long-term impacts or expected that recovery was going to be better than initially anticipated.

Table 8: Producers' Comments on the Design and Implementation of the Government Assistance Programs in Response to the 1998 Ice Storm:

General comment	Frequency
Funding process was slow	23
Assistance programs were good and helpful	23
Clean up crews were very helpful	8
Concerned about follow-up assistance and programs for continued recovery	7
Some disorganization and confusion with assistance administration; too many government agencies involved	6
Clean up crews were slow and/or inexperienced	6
Other comment	6
No comment	21

Table 9: Producers' Comments on the Role of the Ontario Maple Syrup Producers' Association in Information Transfer and Other Ice Storm Programs:

General Comment	Frequency
Did a great job, very instrumental in getting government assistance	38
Information was very helpful	10
Information was not very useful	3
Lanark county received help first; other producers were waiting	3
No comment	32

Table 10: Producers’ Comments on any Additional Impacts of the Ice Storm that were Important to Local Producers:

General Comment	Frequency
Concerns about the long-term impacts, some producers are questioning if they are going to produce in the future	5
Recovery is looking good; people may have underestimated trees’ ability to recover	4
There needs to be more information exchange about recovery and management responses	2

Conclusions and Discussion

This survey was conducted as part of a larger project examining the economic impacts of the 1998 ice storm on maple producers in eastern Ontario. The objectives of the project are to characterize the expected changes in costs and revenues for individual maple producers and the impact of the storm on the eastern Ontario maple syrup industry. The results of the producers’ survey indicate that production since the ice storm has been adversely affected and that producers are incurring additional costs in response to the damage. The impacts of the storm damage on the yield of syrup is also being examined by researchers at the Ontario Forestry Research Institute (Ministry of Natural Resources). The information from these studies will be used to examine the cost-effectiveness of alternative responses to the ice storm at the producer-level. Information regarding participation in and comments on assistance programs will be important for the design of future policies related to natural disasters and agroforestry.

Appendix A: Survey Questionnaire

(Preliminary Letter)

Dear Producer;

My name is Jennifer Kidon, and I am working as a research assistant with Dr. Glenn Fox in the Department of Agricultural Economics at the University of Guelph.

We are currently working on a research project that is part of the Canada-Ontario 1998 Ice Storm Economic Recovery Program. Our research is focusing on the effects of the damage on the production and supply of maple products in Eastern Ontario and on the economic significance of different management options and remedial measures in response to the ice storm damage. We are also interested in producers' participation in government disaster relief programs and their effectiveness in restoring economic activity to the maple industry in the ice storm area.

You may be contacted soon by a student who will be asking for your cooperation with a survey of maple producers which will deal with the subjects of our project. This survey has been reviewed by the Ice Science Program Advisory Group and by the Research and Technology Transfer Committee of the Ontario Maple Syrup Producers' Association. We estimate that the survey will take about 15 minutes to complete. **The information given in the survey will be strictly confidential and seen only by the people directly involved with the project.** Your participation will be greatly appreciated and very valuable to our research.

If you have any questions about the survey, please contact me at the e-mail address or phone number below.

Thank you,

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(Telephone Interview Survey)

Hello Mr./Ms. _____

My name is _____ and I am conducting a survey of maple producers in eastern Ontario that were affected by the 1998 ice storm. Hopefully you have received our letter about the survey and its importance to our research. Do you have a couple of minutes for me to ask you a few questions about your maple operation?

The survey is going to be used for a University of Guelph research project that is part of the Canada-Ontario Ice Storm Economic Recovery Program. We are looking at the effects of the ice storm on the production and price of maple syrup and the effectiveness of government assistance programs. This survey has been reviewed by the Ice Science Program Advisory Group and by the O.M.S.P.A. Research Committee. **The information you give in this survey will be strictly confidential and seen only by the people directly involved with the project.** The survey shouldn't take more than 20 minutes to complete.

1998 Ice Storm Maple Producers' Telephone Survey

What is the approximate area of your maple bush: _____ hectares or acres

What was your O.M.A.F.R.A. Tree Assessment Damage Rating: _____%

Please indicate which production techniques or systems used in your operation:

Bucket/bag system

OR Plastic tubing system: With or without Vacuum pumps

Fuel system for evaporator: Wood fuel
Oil fuel
Other

Reverse Osmosis

Preheaters

Syrup filtration: Sedimentation

OR Gravity filtration

OR Forced pressure filtration

Do you have any other comments concerning your production techniques:

2. Have you applied and been approved for any of the following assistance programs?

Eastern Ontario Disaster Relief Committee Assistance (maple sugar bush portion)

OMAFRA Tree Assessment Program

Farm Credit Corporation and Canada-Ontario Interest Reduction Program
for two-year loans (\$5,000-\$50,000)

Canada-Ontario Business Recovery Assistance Program (COBRA)

Forest Recovery Assistance Program (FRAP) (Ministry of Natural Resources)

Human Resources Development Canada - Job Creation Partnerships for hiring
clean-up crews and professional climbers and pruners.

3. What actions have you taken in your maple bush so far in response to the damage caused by the 1998 ice storm? What remedial actions are planned for the future?

Remedial Actions taken so far	Approximate Start Date	Approximate Completion Date	Activities	Expected Benefits and their timing	made possible by government funding?
Planned Remedial Actions	Planned Start Date	Expected Completion Date	Planned Activities	Expected Benefits and their timing	

Are there any activities that you listed that would not have been possible without government assistance (funding)?

4. Please indicate the approximate number of taps, the total production of syrup, and the size of your maple bush for 1997, 1998 and 1999.

What production levels do you expect for the 2000 season?

Year	Approximate total number of taps	Approximate TOTAL production of syrup (litres)	Approximate size of bush tapped (specify ha or acres)
A "Normal" Year before the storm (or 1997)			
1998			
1999			
Planned for 2000			

5. If you have changed the size of your operation since the Ice Storm in 1998, please describe how this change came about.

Tapped fewer trees OR Tapped more trees

Fewer taps per tree OR More taps per tree

Leased out land

Made changes in equipment Other (please specify) _____

6. Are there any additional impacts of the 1998 Ice Storm that are important to you (or other local producers) that have not been covered in this survey?

7. Do you have any suggestions to improve the design and implementation of assistance programs in response to extreme weather events like the 1998 ice storm?

8. Do you have any comments about the role of the Ontario Maple Syrup Producers' Association's in information transfer, the tree assessment program or other ice storm-related projects?

Thank you for your help with our research project.

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