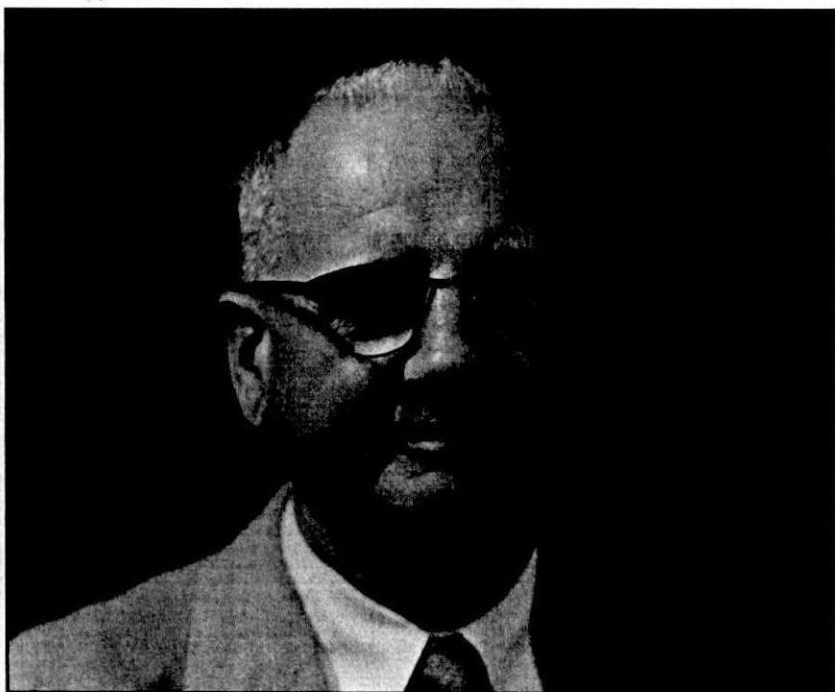


Maple Syrup *Digest*



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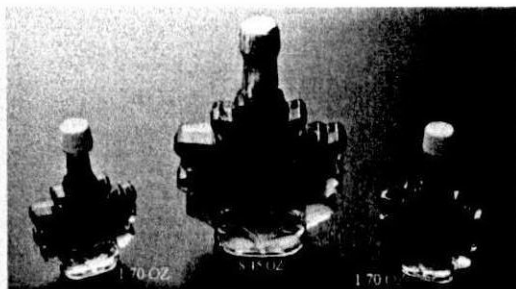
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GREETINGS FROM YOUR PRESIDENT



I hope the new year is greeting everyone with good news. I wonder if the Y2K bug has something to do with the weird weather we are having. Here in the East the winter has been anything but ideal for sugaring.

I'm sure everyone has heard that Sumner Williams died in an unfortunate accident last fall. Sumner was a one of a kind person. Over the years we have worked on a good number of projects with Sumner and always with complete satisfaction. He had the capability to take on the most complicated project and then explain it to us laymen in a language we all would understand. I know from personal experience that on a number of occasions I had a puzzling question concerning maple and when I called Sumner he never failed to explain my problem in terms that made things a lot clearer. His shoes are going to be hard to fill. It is hoped that the research endowment fund will be an ongoing honor to Sumner. At the annual meeting in Maine last October both the IMSI and the NAMSC contributed to the fund. We will all miss him very much. Our heartfelt condolences go out to his family.

As you may have read in the December issue of the Maple Digest, Dr. Charles Willits passed away last July. He was one of the founding fathers of maple industry as we know it today. He spent over 30 years of his life dedicated to the maple industry. He was involved in

the publishing of the first maple manual for sugarmakers as well as other maple related publications. In his will he donated a sizable amount of money to the NAMSC. This money is being put into an interest bearing account in his name. Due to terms and conditions of his will we will be able only to use the interest for worthy projects in the NAMSC. I hope we can set up an ongoing perpetual memorial to Dr. Willits. We will bring this matter up at the annual meeting in Vermont next fall.

I would like to make a correction to my E-mail address printed in the last issue. My correct E-mail address is windyhill@compserve.com.

I hope this did not cause to many problems . . . sorry.

Let's all pray for good sugaring weather this spring and make lots of syrup.

See you next time.

Sincerely,
Hank Peterson
President

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LETTER TO THE EDITOR

We have been making maple syrup for 52 years. Having purchased this farm in 1947, we learned from the old timers that syrup was made here since 1900 or before. There have been developments in syrup making that are destroying this delicious product.

In 1954 we were making syrup with our neighbor when plastic pre-filters first came on the market. They were easy to clean and filtered better than cotton flannel. Our first experience with these filters produced syrup that had a taste of plastic. We quit using them immediately. Since then we have heard complaints of syrup tasting of plastic and they blame the plastic containers. It is not the containers, but the plastic pre-filters. I can tell by the taste of syrup if plastic pre-filters were used.

Now comes the new product called Atom, a chemical defoamer that gives syrup a terrible taste. In 1978 our supplier sold us some. It certainly does defoam. About half of our customers brought back the syrup and said it wasn't fit for a dog to eat. Needless to say, we lost a year's production and went back to making it right the next year. We lost several customers. I was talking to a retired industrial chemist and was telling him about it. He told me the product was made for commercial boilers to stop foaming, but it would give syrup a bad taste. We have had people visiting who told us they do not like the taste of maple syrup. After tasting our syrup they said it was very delicious and bought some. We are gaining new customers from other producers using this chemical

defoamer because their syrup tastes terrible.

By the way, we use only cotton flannel pre-filters and margarine or butter as a defoaming agent. Also we use only tin or glass containers for our syrup and our customers love them.

Frederick Morris
Lake Odessa, MI

LETTER TO THE EDITOR

Recently, long-time New York maple producer and industry leader, Frank Brodie lost his home and all its contents in a devastating fire. A fund has been set up to help Frank and his family get through this difficult period.

Checks can be made out to Otsego County Farm Bureau (Please write Frank Brodie in the note). Send contributions to: Dorothy Rathbun, OCFB, 3286 County Highway 35, Schenevus, NY 12155-9715.

Sincerely,

Patrick M. Hooker

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LETTER TO THE EDITOR

I am sending you a photocopy of a synopsis on global warming, due to the greenhouse effect, published in the December 13, 1999 issue of Time Magazine. It is the opinion of many scientists here and abroad, that global warming has begun and is slowly changing our environment, as we know it.

Unless we do something to curb pollution and the exploitation of natural resources the future generations of animals and plants could be harmed. I wrote an article in 1988 that was published in the Maple Syrup Digest. I believe it would be timely to have it reprinted by the Digest, together with the Time's synopsis that I enclose

Sincerely,

Mariafranca Morselli, Ph.D.
Research Professor Emerita
The University of Vermont

EDITORS NOTE: Articles appear on pages 20-28.

10th ANNUAL HEBRON MAPLE FESTIVAL

**Saturday and Sunday
March 11th and 12th, 2000**

Winter months got you down? Come and enjoy a family weekend of MAPLE related events. Enjoy self-tours to the six maple sugar houses at Connecticut's only Maple Festival. The festival highlights more than 30 maple related events throughout the town of Hebron. There will be pancake breakfasts, sugar on snow, arts & crafts, demonstrations, see how maple is made, taste maple, and much more. The festival runs from 10 a.m.-4 p.m., starting at the junction of Routes 66 and 85 in Hebron. It is a good time for all.

A program with map, may be obtained at most Hebron businesses. For an informational flyer send a self-addressed stamped envelope to Hebron Maple Festival, PO Box 131, Hebron, CT 06248-0131, or view our webpage: <http://users.cyberzone.net/bcouture> or e-mail: bcouture@cyberzone.net.

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REMEMBERING "DOC" WILLITS

By Russ Davenport

The pioneer of maple research has passed away. Working with the Eastern Regional Research Laboratory in Philadelphia, PA, Doc Willits led the way in the modern research in maple. An article in the first NATIONAL MAPLE SYRUP DIGEST (Volume 1, No. 1) by Willits says "More changes probably have taken place in the maple industry during the past decade than in the preceding 100 years. The result has been a modernization of the industry so that it is now comparable to and competitive with other farm enterprises.

The first research problem that has to be solved if any worthwhile contributions were to be forthcoming, was that the nature, source, and factors affecting maple flavor and color. It was soon learned that neither maple flavor no color are inherent in maple sap. Instead only their precursors are there, and it is only after certain conditions have been brought about that these two attributes become apparent. Thus it should be possible to control the amounts of flavor and color produced. Two additional important and basic discoveries were made: (a) sap contains only sucrose and no simple sugars and (b) to obtain maple color (and flavor) the solutions must contain the alkaline decomposition products of simple sugars or their equivalent. Subsequently it was established that the simple sugars were obtained by microbial fermentation of sucrose in the sap. The logical and important conclusions followed was that color of

the finished syrup could be controlled by controlling the growth of microorganism (fermentation) in the sap. Thus, keeping the sap essentially sterile assures the production of very light amber syrup regardless of time during the season it was made, or by whom, or in what processing equipment."

The same is true today — fresh, clean sap makes nice light syrup. Sanitary equipment from the tapping bit to the bottling equipment is so important.

Willits experimented with covered evaporators (steam hoods) to keep everything clean and more enjoyable for the operator. Much of the early research on the maple taphole pellets was led by Willits, also work in removing scale in maple syrup evaporators. Precision instruments were important to making superior maple syrup. Willits outlines this in the Agricultural handbook No. 134 MAPLE SYRUP PRODUCERS MANUAL. The freezing of sap to remove water was also researched.

All early meetings of the National Maple Syrup Council had programs by Willits which were really reports on research being done by him and other research people in the industry. A few of these other people were F.E. Winch, Jr. of Cornell, F.B. Trenk from the University of Wisconsin, J.W. Marvin of the University of Vermont, and P.W. Robbins of Michigan State University. Other common names were Lloyd Sipple, Bob Lamb, Claude Hills, J.C. Underwood, George Kein, Bill Gabriel, Fred Taylor, Arch Jones, Mel Koelling, Fred Laing, Bob Morrow and Linwood Lesure to name a few.

The first MAPLE SYRUP PRODUCERS MANUAL (Agriculture Handbook

No. 134) was the work solely of Willits and a few of the above named. This was issued January 1958 by the U.S. Government Printing Office, Washington, DC and the price was 60 cents.

The second MAPLE SYRUP PRODUCERS MANUAL was issued November 1963 with revisions in June 1965 and revised again slightly in July 1976 at the price of \$2.50 with a 25% discount for 100 or more copies to one address.

A process researched by Willits became one of the most used and today the most important pieces of equipment in all sizes off operations. The reverse osmosis machine revolu-

tionized the industry. Tremendous labor and fuel savings are a result of this technology.

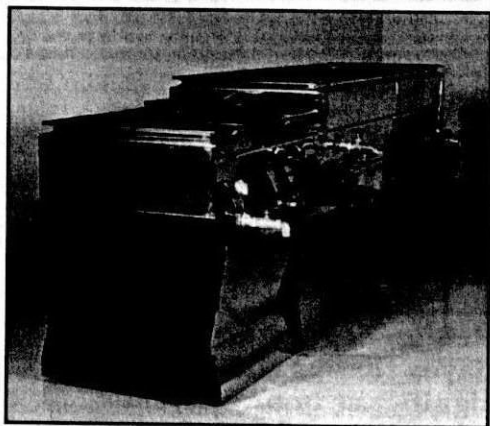
Most sugarmakers of today did not have the pleasure of knowing and working with Doc Willits, but nearly all segments of the industry are still benefitting from his work. It is also fitting that the American Maple Museum in Croghan, NY has been made a benefactor of this great person. His work will be ours forever.

Doc Willits retired in 1969.

EDITORS NOTE: Doc Willits also remembered the North American Maple Syrup Council in his will.

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IMSI NEWS

With the beginning of the year 2000, the weather in maple country was unusually warm and in much of the area, snowless. What does that mean? Expect a normal season? What is a normal season? It is guaranteed that some areas of the maple world will have a huge crop, some areas will have a small crop due to poor weather conditions and the 2000 world's maple supply will probably be adequate, due to expanded production in the provinces of eastern Canada.

The world's largest maple producing entity, Quebec, will continue to expand their production and marketing efforts. In 1999 a statistical analysis done to determine the number of taps in Quebec, provided the number of 29.2 million. Based on that number, if the spring 2000 production averaged 2.35 pounds per tap, as it did in 1999, the production from Quebec alone would be 68.7 million pounds again. That of course doesn't take into consideration the addition of a few more million taps that are probably being installed as I write this column.

I am predicting that the Quebec government will put in place a safety net for Quebec maple producers. At the October, 1999 annual meeting of the Quebec Maple Producers Federation much of the time was used to develop a proposal that would have the province offer a modernized income assistance program, perhaps as soon as April 2000. This proposed program would assist in insuring the loss of trees as well as short crops. With the tremendous investments taking place in Quebec and other Canadian provinces, such a program

was deemed essential to maintaining a steady crop for the world markets.

Vermont's Commissioner of Agriculture Leon Graves has announced that the allowable lead levels in maple syrup, beginning on January 1, 2000, is 250 ppb. This is a reduction of 100 ppb and the number to which the Vermont Commissioner of Health has been trying to reach. The Vermont industry leaders are confident that this number will become the new standard for the industry.

Since the 1994 announcement that Vermont authorities had recalled some syrup from producers shelves, for lead levels higher than 500 ppb, the international industry has made great strides in equipment manufacture and methods of making sure that maple sap or syrup is not exposed to lead containing materials.

The Vermont Department of Agriculture will continue its random testing of product from producers, packers and retail establishments.

Vermont maple sugarmakers are preparing to host the 2000 joint meetings of the International Maple Syrup Institute and North American Maple Syrup Council. A committee has been working for two years to develop a top quality program that will include business sessions, producer seminars, poster sessions, a selection of tours to some of Vermont best producers, and probably the largest maple trade show to ever have been held.

Unique to the United States hosted 2000 session is anticipated to be simultaneous English/French translations. The committee is working on developing sponsorships to make this necessary service available, especially with Quebec being Vermont's closest

neighbor and anticipated Quebec attendance at a higher than normal level.

The Vermont team is also working out a deal with the American Maple Museum "Hall of Fame," in Croghan, NY. They intend to bring the Hall of Fame to Vermont for this session, making the program available to hundreds of producers that otherwise could not view the exhibit of honorees.

In December the committee announced a sponsorship program to help them make the 2000 more affordable to those who wish to attend. The committee sent out letters requesting sponsors, to date several have responded positively and it is anticipated that costs to attend will be quite reasonable.

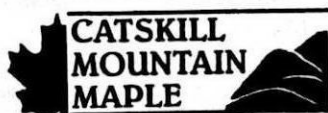
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NEWS FROM INDIANA

By Steve Deatline

A record crowd attended the Indiana Maple Syrup Association (IMSA) winter meeting at the Maplewood Nature Preserve near LaGrange, Indiana, on December 4, 1999. Several new members and visitors were welcomed.

Kenneth Shipley of Gaston, spoke on tips toward producing quality syrup, stressing cleanliness as the single most important. Joe Polak of Merrill, WI talked about marketing both wholesale and retail. Then he, George Fogle of Mason, MI and Don Dodd of Niles, MI, discussed new developments in equipment and supplies. After a noon meal of pancakes, sausage and fine Indiana maple syrup, Gregory Yapp, consulting forester, discussed the gypsy moth and it's slow progression through the state, beginning at the far northeast corner. He also discussed the Asian longhorned beetle and general maple decline. Jeff Settle, Indiana Department of Forestry talked about managing forests for maple production and what services are available from the IDF for maple producers.

The anticipated set-up or IMSA webpage was discussed. Don Adams, Mooresville, is attempting to get financing for this project so that it will cost the association as little as possible. Members will be kept informed about the webpage by newsletter. The cookbook was also discussed by the members and it was decided to print a small cookbook in larger numbers and probably also a larger book.

Directors were elected as follows:

North District: Larry Yoder, Goshen; Garry Sink, Roanoke; Central District: Kenneth Shipley, Gaston; David Hamilton, New Castle and South District: Florence Williams, Rockville and Phil Hanner, Norman. The possibility of adding at least one more director from each district was discussed and will be voted upon next meeting. The suggestion was also made to have a spring as well as a fall meeting but no definite decision was made about that at this time. A committee will be appointed to look at changes that need to be made in the bylaws. This will also come up for discussion and voted at the next meeting.

New, small as well as experienced producers had an opportunity to "Ask the Experts" during a question and answer session led by Larry Yoder. This was well received by all as we saw that we all need to learn more about our industry.

The group toured the sugar operation at the Nature Center, then after the meeting, several members also toured the Edsall Sugar House at near-by Kendallville. This latter is a new operation with newer more state-of-the-art equipment than most of the producers present have at this time.

Officers were then elected for the year 2000. President, Steven Deatline, Lynn; Vice President, Larry Yoder, Goshen; Secretary and Editor of THE TAPLINE, Dave Hamilton, New Castle and Treasurer, Kenneth Shipley, Gaston. After much discussion, it was decided to retain Steve Deatline as public relations contact, as well as president.

Next planned meeting will be in the South District December 2, 2000.

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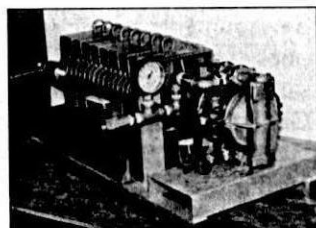
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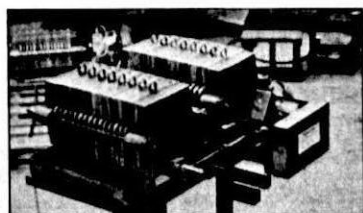
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SAVE THE DATE MAY 20, 2000

The opening program of the North American Maple Museum will be the third Saturday of May, in the new millennium. Part of this ceremony will be the induction of the newest members to the North American Maple Hall of Fame. Last year, this ceremony saw the 50th member inducted, Florence Lamb.

This May we will induct three people who have been very prominent in our industry. They will be Warren Wells, Gary Gaudette, and Richard Haas.

Warren Wells, of New York, has been outstanding in the marketing of pure maple products. He has been very visible in the national promotion programs for maple, holding several positions at both the state and national level.

Gary Gaudette, of Leader Evaporator Co. in St. Albans, VT, has been a leader in the manufacturing of maple equipment. Also a priority of Gary's has been the long term commitment to international development and leadership for both IMSI and NAMSC.

Also to be inducted will be **Richard Haas** of "Sugarhill" maple containers. Dick became manager, then owner, of Hillside Plastics to make plastic bottles for cider and milk. Eventually the business, in 1971, started making plastic bottles for maple syrup. This now represents about 45% of the company's total sales, which has a work force of over 80 full-timers. Though Dick has retired as President of the company, he still remains on as the Treasurer. As the founder of Sugarhill Containers he

is still always trying to build the better maple mouse trap.

I would like to invite and encourage all friends and supporters of these three people to attend their induction ceremony at the Maple Museum in Croghan, New York, on May 20 of the new century. The installation is only part of the opening program of the museum. There will also be a great pancake breakfast, a queen contest, equipment and dealer displays, as well as the museum itself.

Sincerely,

Russ Davenport
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WISCONSIN MAPLE TOUR

By Gretchen Grape

It was a beautiful fall, crisp day in October, when we all gathered at the Northwoods Supper Club in Fifiield to greet fellow syrup makers before our tour began.

Our first stop on the agenda was at Kathryn and Lawrence Fenzls in Butternut, WI. Their maple syrup, Christmas trees and tree baling operation is known as as Fenzl Indus trees. Pretty catchy!

Their maple syrup building is 20' x 24' which houses a 3' x 10' evaporator. They keep an annual growth rate record on each tree. In addition to this, their son Greg keeps a spreadsheet for-

mulating data such as total gallons, gallons per tap, sugar points per tap, etc. Fenzel buys sap and has a spreadsheet formulated to exhibit individual supplier performance and performance comparisons up to and including the last four years of performance.

Our second stop of the morning was at the Northern Wisconsin Maid Sugarbush, owned and operated by Rosemary and John Slack of Park Falls. Their sugarbush is located 15 miles from their plant. Sap is collected on pipeline and hauled to their facility. They usually burn about 100 cords of firewood a season and make 2,500 gallons of maple syrup from about 100,000 gallons of sap. Their sugarbush has 40 miles of tubing and about 10,500 taps every spring.

Rosemary operates their small gift



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shop, which is very unique. Her husband made her a display stand from a tree and the shelves are circles of wood cut from a tree. She hosts an open house in the spring and again the day after Thanksgiving.

After this stop our bus and cars all departed for the Northwoods Supper Club once again, where we had our lunch followed by a short program. During this time, we enjoyed a short message from our Wisconsin Maple Queen.

We then boarded the bus or our cars and toured the Sue and Dave Denzine's Fish Farm. There are twenty ponds that are all spring fed. They raise game fish including walleye, hybrid blue gill, both large and small

mouth bass, perch, crappies, northern pike and muskie. They are all sold for ponds and lake stocking. They also provide fishing for a fee.

The last stop for the day was at Laura and Charles Bryan's log sugar house and their solar home. Charles explained about the construction, had many demonstrations going on about logs (peeling, scrubbing, carving, jammers and different types of wood handling).

We then toured his log sugar house and solar home. There were very many unique features shown to us, both in the log sugar house and the solar home. Along with these features, there were many really neat saying posted.



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MAINE MAPLING

By Dawn Bolduc

Word from Maine again? You bet. This is where things are happening. Easy, no snow, driving got a good turnout at our last meeting of the 20th century. A wrap, almost, of the October Show biz — with some information to be passed along to next year's Show developers.

Maine's annual Agricultural Trade Show (in a couple of weeks) is the traditional gathering for "tire kicking" and educational updates for all the commodities, as well as association elections within these groups. So there was quite a flutter of commentary and planning from all corners of the room; nominations to be made, Extension Service needs to be attended, and the usual call for volunteers.

A couple of interesting marketing opportunities arose that opened with the ubiquitous donations first. It was resolved that the Maine Maple Producers Association would purchase the syrup from sugarmakers who wished to participate and it would be labeled as a MMPA product. Follow-up orders could be made through the secretary and filled by any member prepared to meet the requirements. One member had an inquiry from Chile, where they make a palm syrup — and would like to incorporate maple syrup in their final product. Sort of raises a question of how might the maple syrup fare as to percent and in the advertising?

This "open" winter has given our sugarmakers a good opportunity to work the bush. There have been a lot of blowdown throughout the state due to thrashing winds. Our northern area

sugarmakers have been working their bushes for over a month now (as of New Years Day) and have some snow. Some say that with too deep a frost they had experienced a lack of response from the trees at saptime. By the time you read this they will be all tapped and running. Due to lack of snow the height of the taps will present a problem — here in the Western Mountains we usually have over two feet of snow at this time.

In the St. Aurelie area a couple of the big bushes are changing hands. Some of these operations have been in one family over a hundred years. And we hear from various "droplines" that there is a renewed interest in the Patten area. The McDonald Investment Group of Alabama (new owners of North Woods border lands (managed by Wagner Forest Mgt., Ltd.) through their forester, M.S. Wieder at Clayton Lake, are in the process of renegotiating long standing leases of the sugar bushes (many made on a handshake). There is an uneasiness about the outcome of the new terms. Maybe these will be reflected in higher syrup prices by the barrel.

We want to thank The North Woods Association — for their late billing and reconsideration of the final costs for road use fees to the Pittston Farm (the inn serving the Golden Road maple area).

We put some thought to a new poster for Maine Maple Sunday, which is very strong in southern Maine. This is a group effort with the Me. Dept. of Ag.'s Deanne Herman and new assistant Carol Jones.

Its another tapping season — in a special new year — do something extraordinary!

ENVIRONMENTAL STRESSES ON THE SUGAR MAPLE BY THE YEAR 2000 MAY AFFECT SAP BIOCHEMISTRY, HENCE SYRUP GRADES

By

Mariafranca Morselli

*Research Professor, Maple Research Laboratory,
Botany Department, University of Vermont*

First published in the Maple Syrup Digest in 1988

It is well known that environmental stresses, be they biotic (naturally occurring) or abiotic (human-made), alone or interacting, bring about maple decline. But it is a matter of speculation of the degree to which those stresses may affect sugar maple health and vigor, or the length of sap seasons, or alter the metabolism of the living cells in the wood of the tree. Such changes affect the biochemical composition of the sap and will, in turn, affect the maple syrup chemistry, hence syrup grade.

We know that the great diversity of maple syrup flavors reflects the biochemical differences within saps. These differences result from the constantly changing metabolic activity in wood cells during the sap season caused by natural events such as daily climactic change, differences in soil chemical composition, etc. However, abiotic events also may affect sap biochemistry. If long-term environmental and climactic changes occur and abiotic stresses continue, by the year 2000 it is likely that maple syrup color and flavor will be affected, and that maple sap production will decrease because of fewer freeze-thaw cycles, shorter sap seasons, and/or less maples available to be tapped.

BIOTIC CAUSES

Among the well-known biotic causes of stress to the maple tree are drought, a lowered sugar reserve in maple wood as a result of insect defoliation, and pathological conditions involving fungi, bacteria, and viruses. Furthermore, maple trees tapped in colder areas have to contend with extreme temperature changes below and above the freezing point, and are more subject to stress.

ABIOTIC CAUSES

Among the abiotic causes of maple decline in sugarbushes are: overtapping, which causes more wood tissue to stop translocating sap; the use of the paraformaldehyde (PFA) pellet in the taphole, which increases the area of non-translocating wood (more than 3 million pellets have been used during the 1987 sap season alone); and root damage by cattle grazing and by snowmobiles and heavy equipment.

Other abiotic causes of stress and decline of the maple tree are directly or indirectly produced by human technological advances. Soil fertility and the tree nutrient cycle may be changed by acid rain or fog that contains pollutants (such as nitrogen oxide (NO_x), sulfur oxide (SO_x) and ozone (O_3), formed from (NO_x) transported by the wind from high smoke stacks. The sap season may be shortened by the eventual occurrence of the "greenhouse effect," which will increase the global temperature by 2-4 degrees F (4-7 degrees C) in the next few decades. This is due to a 30 percent carbon dioxide (CO_2) increase in the air since 1950, which has trapped infrared radiation and prevented heat from escaping the earth's surface. An increase of temperature during the sap season may force early budding of the maple tree, thus shortening the sap season and affecting syrup quality.

Damage to maple leaves may occur from the increase of ozone in the atmosphere. Other harmful effects to the biosphere are occurring at the same time, because of the destruction of the ozone layer from 10 to 30 miles above the earth by chlorofluorocarbons (CFCs) released in the air from aerosol propellants and refrigeration systems which allow ultraviolet (UV) rays to reach earth. This ozone depletion (called the "ozone hole") has increased yearly to 28 percent in 1987, while chlorofluorocarbons have increased to 11 percent.

SALT — ANOTHER ABIOTIC CAUSE

Sodium is not found naturally in forest soils. In our laboratory we have confirmed that the alarming decline of roadside maples is correlated with the absorption of high levels of sodium from the de-icing salt that dissolves in groundwater. We are investigating whether an increase of sodium in sap from roadside maples is matched by an increase in sap of nutrients (potassium, calcium, magnesium, etc.) probably leaching from wood cells because of high sodium in intercellular spaces. This study focuses also on the absorption level of aluminum and heavy metals in sap from oil through groundwater.

We have also found that sap flowing in tubing systems that have not been rinsed after bleach washing has higher levels of sodium than sap from well rinsed tubing. Unrinsed systems are responsible for a salty flavor in some maple syrups.

WHAT THE FUTURE HAS IN STORE

We cannot predict whether by the year 2000 all these interacting causes of environmental changes will threaten the survival of the maple tree as an ecological inhabitant of the northeastern regions of North America. Some scientists predict northward advancement of sugar maples and other northern hardwoods into areas occupied by sub-arctic forests.

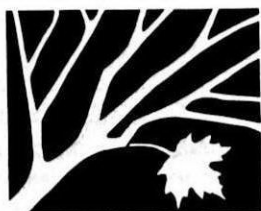
Also, I cannot give you an accurate picture of the possible changes that may occur in sap biochemistry affecting syrup color and flavor grade. These changes begin in the living cells of the wood tissues that are close to the sap conducting elements (vessels). These changes are independent of those that are caused by the enzymatic activity of microorganisms in sap, whether in tubing, buckets, or storage tanks. Microorganisms mainly affect sap sugar by changing sucrose into

glucose, which is responsible for syrup darkening and development of a caramel flavor during sap processing.

Some of our controlled studies on the biochemistry of sterile saps collected from individual maples have indicated that moderate warming trends have increased differentially the level of the primary amines, including amino acids. These sap components may cause off-flavors in syrup, such as "buddy." Changes in sap phenolic components may also affect the syrup chemistry, resulting in darkening the syrup color grade, even after packing. We are presently encountering color darkening of some syrup in bulk storage. My hypothesis, which I would like to prove with your financial help, is that the very high temperature up to 70 degrees F (21 degrees C), which has occurred during the last two seasons especially in sugarbushes that normally are warmer than others, may have brought about metabolic changes in the tree tissues rarely occurring early in the sap season. We do not know whether these changes have occurred in the past, affecting the sap phenolic composition to mimic that of the end of the season. It is unknown to what extent the changes in phenolic composition may be related to maple decline.

WHAT ARE THE POLITICS

Can anybody help in reducing the multitude of probable causes of stress and decline of the sugar maple? First and foremost it is important to exercise our polit-



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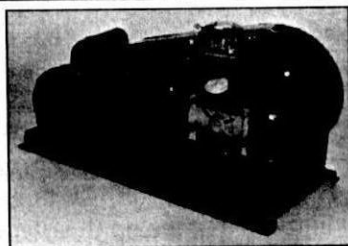
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ical rights as citizens by lobbying our elected officials to promptly implement the Clean Air Act of 1970. This law mandates reduction of toxic emissions from industrial sources, but key congressional leaders oppose many provisions of the act. Consequently both the United States House and Senate have approved separate legislation that extends the deadlines for states and cities to implement the clean air act provisions. However, at the end of the 1987 legislative session the House has approved an eight-month extension, much shorter than the proposed 21 month extension. This action by the House still would allow for approval in 1988 of the comprehensive set of amendments to the Clean Air Act, approved in December 1987 by the United States Senate Committee on Environmental and Public Works. The State of Vermont has opposed the extensions.

The provisions of the original act are designed to reduce the emissions of at least 224 specific toxic air pollutants that would control acid rain and some of the other effects harmful to the environment.

Representatives of the United States and 24 other countries have signed in September 1987, the Montreal Protocol, which promises to halve the production and use of ozone destroying chemicals by 1999. On December 1, the Environmental Protection Agency (EPA) issued new performance standards to achieve 90 percent reduction of SO₂ from steam generators. Citizens should keep themselves informed of these developments, and let their elected officials know that they want to preserve the environment which belongs to all.



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WHAT YOU CAN DO

As for a direct action to improve the current situation of your sugarbush, I suggest the following nonprioritized recommendations, based on the research results that we and others have published.

- Constantly evaluate the condition of your sugarbush for maple decline.
- Determine if the sugarbush needs fertilization by testing nutrient availability by analysis of the chemical composition of leaves of healthy maples and that of the soil gathered from different areas of the sugar bush. Some scientists suggest that only leaf analysis is necessary.
- Tap your maples in a clean way and use the best available methods to maintain or improve sanitation of the sap collection systems and storage. Discourage the use of the PFA pellet to minimize long-term harmful effects to the tree.
- Reduce the number of taps per tree (1-3 only, depending on size), and do not tap maples in decline.
- Keep cattle and heavy equipment out of the sugarbush. Minimize recreational use in the area.
- Use only biological pesticides if necessary, and do not use weed killers around maple trees.
- When washing tubing systems with Clorox® solution, stay out of the sugarbush. The sodium and chloride may affect tree health if a large quantity enters the soil.
- Do not mix sugarbush maple sap with sap from roadside trees where de-icing salt is spread. Off-flavor may develop in syrup.
- Ask your town officials to use more sand than salt to make roads less dangerous not only to us but to trees also. Know what proportion of de-icing salt is mixed with sand.
- Tap earlier in the season or at least follow weather predictions very closely. Start tapping maples that are on a southern exposure. If warming trends begin by early February. This may be one way to have a relatively successful sap season. You can always spend some time and money to re-ream the tapholes later, and you will make an even larger and lighter grade crop.
- In buying a sugarbush be aware of the interaction between soil composition and environmental and climatic conditions during the last 5-10 sap seasons (February-April). If the climate has been mostly dry and warm, purchase a sugarbush on silty loam clay soil and located on a northeastern slope. Sandy soils should be avoided, if the prediction of the "green house effect" happens and in the United States there will be a 40 percent reduction of precipitation.
- Look for sugar maples that are healthy among others in decline. Tag them to help scientists in their search for maples resistant to stresses of different types. This will greatly help the future of the maple industry.

In other words, your actions can help determine sap biochemistry and syrup grades by the year 2000. Let's all act responsibly.

CITATION: Morselli, M.F. 1988. Environmental stresses on the sugar maple by the year 2000 may affect sap biochemistry hence syrup grades. *Maple Syrup Digest* 28(1):24-28.

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GREENHOUSE EFFECTS

Global warming is well under way.

Here are some telltale signs.

Reprinted from Time Magazine, December 13, 1999

Carbon dioxide and other gases from the burning of fossil fuels collect in the atmosphere and act like the glass walls of a greenhouse, trapping heat on the earth's surface. Scientists predict that the planet's average temperature could rise as much as 6.3 degrees F (3.5 degrees C) over the next century, and we are already seeing heat waves, melting polar ice and rising seas. Local impact remains unpredictable: some areas could suffer stronger storms and other places severe drought. Seven environmental groups — Environmental Defense Fund, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, U.S. Public Interest Research Group, World Resources Institute and World Wildlife Fund — have put together a world map showing "early-warning signs" of global warming. Reviewed by a team of scientists, the signs fall into two categories: direct manifestations of warming, called fingerprints, and events that could become more frequent and widespread with climate change, which are labeled harbingers.

THE HARBINGERS

Vanishing Animals

- **CALIFORNIA** Edith's Checkerspot Butterfly has disappeared from the lower elevations and southern limits of its range.
- **ANTARCTICA** Adelie penguin populations have declined 33% in 25 years because the sea ice where they live is shrinking.
- **CANADIAN ARCTIC** Peary caribou numbers dropped from 24,000 in 1961 to as few as 1,100 in 1997, mostly because heavy snowfalls and freezing rain covered their food supply.

Storms and Floods

- **AUSTRALIA** During August 15 to 17, 1998, a storm dumped nearly 1 ft. (30 cm) of rain on Sydney, three times as much as normally falls during that entire month.
- **KOREA** Severe flooding struck during July and August, 1998. On some days rainfall exceeded 10 in. (25 cm).
- **CALIFORNIA** In February 1998, 21.74 in. (55.22 cm) of rain fell on Santa Barbara, its highest monthly total on record.

Spreading Disease

- **KENYA** In 1997 hundreds of people died of malaria in highlands where the population had not previously been exposed.

- **COLOMBIA** In the Andes, mosquitoes that can carry dengue and yellow fever, once limited to altitude no higher than 3,300 ft. (1,000 m). appeared at altitudes of 7,200 ft. (2,195 m).
- **INDONESIA** In 1997 malaria was detected for the first time as high as 6,900 ft. (2,100 m) in Irian Jaya province.

Droughts and Fires

- **SPAIN** More than 1.2 million acres (500,000 hectares) of forest burned in 1994.
- **MEXICO** In 1998 1.25 million acres (506,000 hectares) went up in flames during a severe drought.
- **INDONESIA** Up to 2 million acres (800,000 hectares) of land burned in 1998, including parts of the already devastated rain forest habitat of the Kalimantan orangutan.

Earlier Spring

- **ENGLAND** 31% of 65 bird species studies in 1995 laid their eggs earlier than in 1971 by an average of 8.8 days.
- **ALASKA** During 82 years on record, four out of the five earliest thaws on the Tanana River have occurred in the 1990s.
- **NEW HAMPSHIRE** The length of time Mirror Lake is covered with ice has declined about half a day per year during the past 30 years.

THE FINGERPRINTS

Heat Waves

- **TIBET** In 1998 Lhasa had its warmest June on record. Temperatures exceeded 77 degrees F (25 degrees C) for 23 days.
- **CAIRO** 1998 brought the warmest August since data have been kept. Temperatures reached 105.8 degrees F (41 degrees C) on August 6.
- **NEW YORK CITY** In 1999 the city had its warmest and driest July on record, with temperatures climbing above 95 degrees F (35 degrees C) for 11 days.

Rising Seas

- **BERMUDA** Saltwater inundation from the intruding ocean is killing coastal mangrove forests.
- **HAWAII** Sea-level rise at Waimea Bay, along with coastal development, has contributed to considerable beach loss over the past 90 years.
- **FIJI** The shoreline has receded half a foot (15 cm) per year for 90 years, according to local reports.

Melting Glaciers

- **INDIA** The Gangotri Glacier is retreating 98 ft. (30 m) per year.

• **RUSSIA** In the Caucasus Mountains half of all glacial ice has disappeared in the past 100 years.

• **PERU** The Qori Kalis glacier in the Andes Mountains is receding about 100 ft. (30.5 m) per year, a sevenfold increase in rate since the 1960s and 1970s.

Polar Warming

• **ALASKA** In Barrow the average number of snowless days in summer has increased from fewer than 80 in the 1950s to more than 100 in the 1990s.

• **ARCTIC OCEAN** The area covered by sea ice declined about 6% from 1978 to 1995.

• **ANTARCTICA** Nearly 1,150 sq. mi. (2,980 sq. km) of the Larson B and Wilkins ice shelves collapsed from March 1998 to March 1999.

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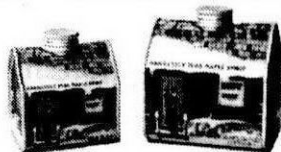
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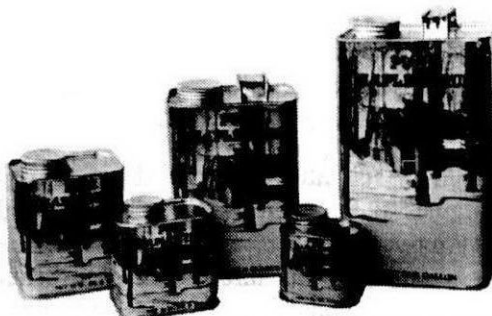
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| 5' x 16' Grimm evaporator w/stainless pans, blower and stainless stack | \$5,100 |
| 4' x 8' Stainless hood & preheater, fits Grimm flue pan | \$1,200 |
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| 10 bbl Small Brothers gathering tank | \$450 |
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NEWS FROM THE AMERICAN MAPLE MUSEUM

By Eleanor Allen

Dr. Charles Willits, a research chemist with the USDA, was a serious-minded, quiet person who was slow to smile. In his time, he was the world's foremost authority on maple syrup production. He wrote the first Maple Syrup Producers Handbook and was instrumental in developing plastic tubing, among many other things. He was inducted into the Maple Hall of Fame in 1978. When he died, in July, 1999, he left a monetary bequest to the American Maple Museum, for which we are very grateful. And he left the peculiar little wood carving pictured here. The carving reads:

***Dr. C.O. Willits
IN APPRECIATION OF YEARS OF
DEVOTION TO THE MAPLE INDUSTRY
N.Y.S. Maple Producers Association***

It seems that Lloyd Sipple and Fred Winch made arrangements to have the carving made for Dr. Willits in Sweden. They sent a photograph of Dr. Willits to Sweden for the wood carver to use as a model. The carving is signed on the bottom, "C.O. Trygg, Sweden 1966." Gilbert Lehman, of Croghan, NY, was present when it was given to Dr. Willits at the NY Maple Tour of 1967 at Snow Ridge, here in Lewis County. Gil remembers that Dr. Willits was pleased as punch with the caricature and couldn't keep his eyes off the statue. We don't know if Dr. Willits ever personally gathered sap in

buckets with a yoke. He was a research chemist after all, and spent many years encouraging maple producers to use plastic tubing instead of buckets. If he did gather sap, he certainly didn't hold the full sap buckets by the ropes. But Gil says that the statue was a really good likeness of Dr. Willits.

Dr. Willits, who was 98 when he died in a nursing home, outlived his friends and family, but he lives on in his valuable contributions to the maple syrup industry and in his legacy to the American Maple Museum. And then, there's this lively little wood carving to remind all who see it at the American Maple Museum that he was a real human being. A picture can't possibly convey the full effect of the statue. Please visit the Museum and see it in person, along with all the other maple artifacts and exhibits!



1999 MAPLE TOUR

The Northeastern Maple Producers Association hosted the 1999 PA Maple Tour. The tour participants included members from the local association as well as from the Potter Tioga, Somerset, Endless Mountain, and Northwestern PA Maple Associations, dealers from New England and Pennsylvania, and also out-of-state guests.

Since Wayne County borders New York, maple producers in Delaware and Sullivan County New York are members of the NE PA Maple Producers. This fall the PA tour included one day of visits to PA as well as one day in NY. The largest producer visited was Irene and August Andersen's third-generation 1000-acre maple farm in Long Eddy, NY. Of special interest were Irene Andersen's candy kitchen tour and the sugar house where they operate a retail store and a mail order business. August Andersen told how he combines raising beef cattle with maple production, and how he has dealt with forest tent caterpillar and other insect damage to his woods since the 1950's.

Harry and Eleanor Wilcox and their son James of Fremont Center were the second New York stop. They operate a 45 head dairy farm on one side of the road, and have an equipment building and sugar house on the opposite side of the road. They maintain a 1200 tap operation which is mostly on plastic tubing.

At Swan Lake, New York, the tour visited Lee Cole's new sugar house. His former sugar house with an oil-fired evaporator burned in 1997; his new building features a 5' x 16' wood-

fired evaporator. For a gathering tank, Lee Cole uses an army truck chassis with a bulk milk tanker body to haul sap. The sap from his 2600 taps is hauled within a 2 1/2 mile distance.

The Wayne County tour featured Ron and Karen Hayden's third-generation Maplewood Farm with over 600 taps in Maplewood, PA. Ron Shemanski and Sam Fox's maple operation using two 2' x 6' evaporators in South Canaan, PA and Jim and Julie Yatonsky's 150 tap maple operation in Waymart, PA. These are some of the local association's younger maple producers; in fact, Ron Shemanski is just 25 years old.

Each of the three Wayne county maple producers combine their work with other jobs. The Haydens have an extensive garden, raise some beef cattle, pigs, and chickens, plus sell honey. In addition, Ron works at Plainwell Tissue Incorporated, and Karen has a part-time job at Kaufman's. They have four school-age sons. Ron Shemanski has a dairy herd and drives a school bus. Jim and Julie Yatonsky are starting a PYO strawberry operation, have a roadside farm stand on the Owego Turnpike, raise Halfinger draft horses for hay rides, plus have a small dairy farm. They are the parents of four children.

The tour also featured four state forest or agricultural agents. Mike Demchik, the new PA Maple Specialist and Non-timber Forest Products Specialist gave a presentation on commercially grown goldenseal and ginseng. NY Senior Forester Mike Pogue and Wayne County Extension Agent Ed Pruss added tour comments. Wayne Co. Forest Specialist Craig Olver, assisting

local logger James Rowe, demonstrated how to safely fell two large dead elm tree.

The Maple Tour included two non-maple stops. At the local Skynet Station near Hawley, PA, participants walked around the satellite dishes used to track satellites and relay information to cable TV providers and to corporations. Inside, workers were talking to overseas customers. Like farming, satellite communications is a round-the-clock, 365 days a year operation; it too is affected by weather conditions. For example, communications are lost if ice or snow collect on the satellite dishes. This former AT & T station employs about 100 workers.

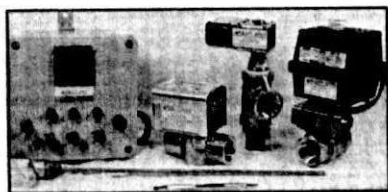
The Tour also stopped at Tompkins Bluestone Quarry in Fishs Eddy, NY. Participants watched a 10-foot diamond blade slice stone slabs off large, 17-ton stone blocks. Other saws round the edges. Blow torches are used to "thermal" the stone by roughing up the smooth surface for a more "natural" look. Thirty people are employed at the tompkins yard and, in addition, over 40 independent contractors quarry stone for the operation. Some uses for the stone slabs are for walls, walks, stair treads, mantles, pool copings, and building facades. Once canal boats carried the stone to cities; now tractor trailers haul the native bluestone nationwide. This is a growing industry — the average weekly shipment is 360 tons.

In NY, the maple participants enjoyed a barbeque chicken lunch served by the Fremont Center Fire Department. During the PA tour, a sausage and pancake lunch was served by the Maplewood Fire Department. The Uphill String Band

entertained following the maple banquet that was held at Central House in Beach Lake, PA.

Another feature of the PA Maple Tour was the selection of the PA Maple Sweetheart. Judges interviewed the contestants during the Friday tour, and at the banquet, each contestant gave a speech or skit about maple production. This year's winner was Laura Sanner, daughter of Ken and Tracy Sanner of Somerset County, PA.

The former 1999 Maple Sweetheart, Alicia Dengler, narrated a poem she composed and accompanied with slides of her family's maple production. This poem was published in The Maple Syrup Digest. Alicia also made an attractive display for the 1999 PA Farm Show. At the 1998 North American Maple Syrup Council meeting in Titusville, PA, Alicia presented a workshop on how the Indians made maple syrup and sugar.



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1999 RESEARCH PROJECTS APPROVED BY THE BOARD OF DIRECTORS — NAMSC

| PROJECTS | TOTAL FUNDS APPROVED |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Cold Storage for Overwintering of Sugar Maple Plant Material — Cornell University, New York | \$3,000 |
| Ozone Treatment of Maple Sap Production for Quality Control — Cornell University, New York | \$3,000 |
| An Investigation of Polarimetric, Rheological and Optical Methods for Detecting Adulteration in Maple Syrup — Proctor Research Center, Vermont | \$3,500 |
| Optimizing Spout Quantity per Lateral Line for Vacuum Tubing Systems — Proctor Research Center, Vermont | \$2,500 |
| Evaluation of Long Term Effects of Maple Fertilization — Proctor Research Center, Vermont | \$3,000 |
| Acquisition of a Multi-investigator Research Spectrophotometer for Maple Studies at the Proctor Maple Research Center — Proctor Research Center, Vermont | \$2,500 |
| Determination of the Correlative Relationship between Sugar Maple Sap Manganese Concentrations and Soil Acidity — Pennsylvania State University, Pennsylvania | \$2,500 |
| Maple Value Added Products "How to Do" Manual — Ontario Maple Syrup Producers Association, Ontario | \$1,500 |
| Tubing Analysis and Sugar Bush Inventory System — Ontario Ministry of Agriculture, Ontario | \$3,000 |
| Sanitation and Cleaning of Tubing Systems — Ontario Ministry of Agriculture, Ontario | \$2,500 |
| Ice Storm Recovery — Ontario Ministry of Agriculture, Ontario | \$3,000 |

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For more information contact:

Barbara or Selden Wells 860-228-9503

WARKWORTH MAPLE SYRUP FESTIVAL

March 11th & 12th, 2000

Warkworth, Ontario

For more information contact:

Alice Potter, PO Box 1, Warkworth, Ont. Canada K0K 3K0 • 705-924-2057

ONTARIO MAPLE SUGAR PRODUCERS SUMMER TOUR

July 19-22, 2000

For more information contact:

Ken McGregor, 30959 Wyatt Road, RR 6, Strathroy, Ontario, Canada N7G 3H7

NEW YORK STATE MAPLE TOUR

July 23-25, 2000

For more information contact:

Lewis Staats 518-523-9337 or Beth Spaugh 518-561-7450

or at: <http://www.cce.cornell.edu/clinton/ag/mapletour/>

See article in December 1999 issue on page 27

VERMONT MAPLERAMA

July 27-29, 2000

For more information contact:

George Cook, UVM Extension Maple Specialist, 29 Sunset Dr., STE 2,
Morrisville, VT 05661 (802) 888-4972 or email: George.Cook@uvm.edu



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THE MAPLE FARMER

By Gail Short

Wood piled high awaits its calling, he was here.

Amid the March madness the trees have sprouted their lines, he was here.

Buckets clatter above the wind, he was here.

Sugar snow falls in silence covering the crusty footprints, he was here.

Droplets seem to echo as they fall in unison, he was here.

Deep hoof prints only a heavy horse could make break the snow, he was here.

A sweet smell lingers in the cold night air, he was here.

Frozen ruts under the full moon give the promise of tomorrow, he was here.

Knee-deep mud under empty buckets seeks the drying sun, he was here.

Warm breezes hint of spring as the buckets disappear, he was here.

Washed buckets dry in the April sun, he was here.

Sugar House is idle once more, he was here.

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