

Maple Syrup Digest



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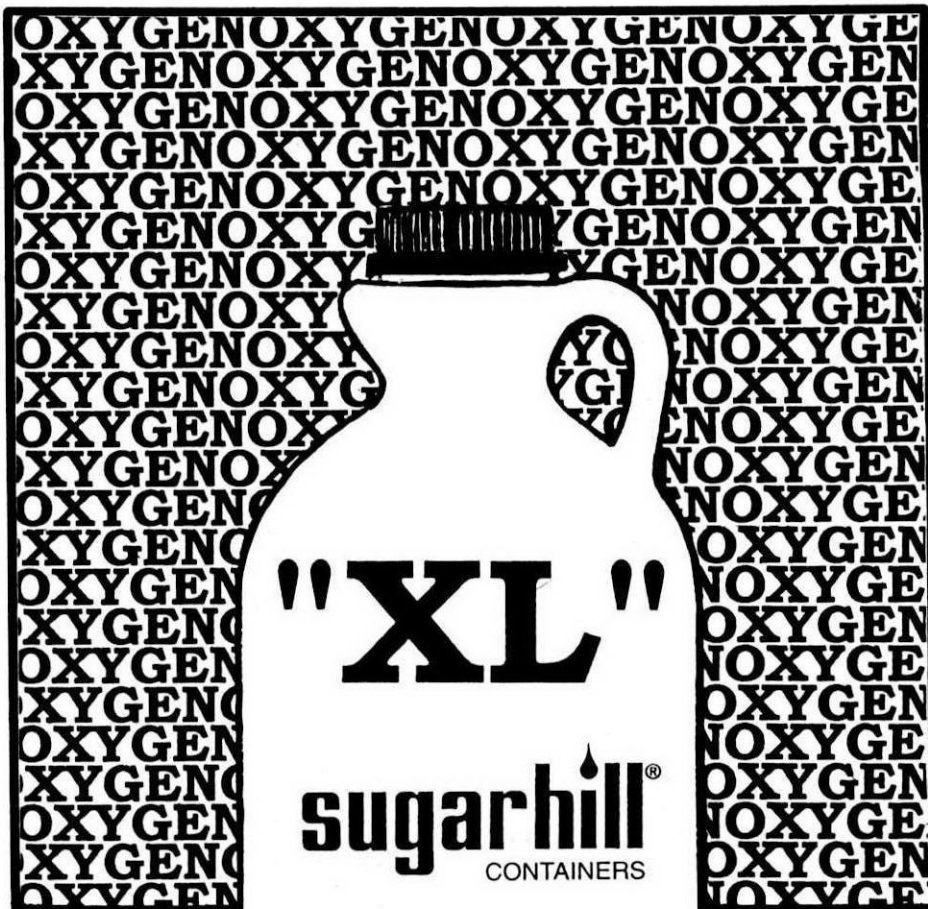
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GREETINGS FROM YOUR PRESIDENT



This Festive season has once again come and gone. It seems that one just gets turned around and another season is upon us. They say the older one gets the quicker time seems to fly, but I wish time would slow down so some of us could catch up.

It has been a beautiful fall for working around the woods, no snow & not terribly cold. With the maple season just approaching, it's hoped that everyone will be of good health and produce lots of good syrup, so everyone will have a chance to taste one of nature's delightful treats.

Sincerely,

Avard Bentley
President, NAMSC

MAPLE GINGER CAKE

1/2 cup white or brown sugar
2 tbsp. shortening
1 egg (beaten well)
1 tsp. soda
1/2 tsp. salt
1/4 cup dark molasses
1/4 cup maple syrup
1/2 cup sour milk
1 tsp. ginger
1 1/2 cups flour

Mix ingredients in order as given, beat well, bake in moderate oven. This makes a delicious dessert, served with whipped cream.

FROM THE EDITOR

Happy New Year. I can hardly believe it is a new year already. The years zip along at an amazing rate. It doesn't seem possible that I started "sugaring" 40 years ago. A lot has changed in this short time. Tubing was introduced and became the most popular method of collecting sap. However, tubing brought along its own set of problems — some of which we are still dealing with today. The lead issue is still with us, although it has died down. Some states had hoped to have the lead content down to 250 ppb by now, but it wasn't possible by the majority of producers.

The manufacturers of maple equipment have made giant steps forward to eliminate lead in maple equipment. Manufacturers can only do so much—the rest is up to the individual producer. There is no substitute for good housekeeping. Simply put—when the sap runs, boil it—don't store it for long periods of time. I know of "back yarders" who only boil on weekends. This diminishes the quality of the syrup and makes for a better chance for lead contamination.

A lot of producers are waiting for more information on the new smaller spout. At first glance, it seems to hold a lot of promise. For you producers that are going to give it a try, let us know what you find.

Not to sound like a broken record, but we need your input to make the Digest work, any articles or pictures would be greatly appreciated.

In response to one letter I received asking if the Maple Syrup Digest has a cookbook available, sorry, no, some associations do, check with yours.

IMPACTS OF THE JANUARY 1998 ICE STORM AND LOOKING AHEAD

By Jennifer Koegl

Opportunity is usually not the first word that comes to mind when thinking of the January 1998 ice storm. However, a rare opportunity to learn and gain valuable information is exactly what Cornell University researchers recognized in the experience. Despite the fact that localized ice storms occur relatively frequently within the northeastern United States, little is documented about their effects on sugar maple or on long term sugar bush health. Thus, in response to the concerns of sugar bush owners and an apparent lack of critical information, a project to measure the long term impacts of ice damage on sugar maple health evolved. The study is part of a larger cooperative effort in the Northeast being coordinated by the USDA Forest Service (USFS). It is intended that this information will be useful in developing best management practices for sugar bushes in the event of future storms of similar effects. Though it is difficult to ponder, the potential that more ice storms may occur in the Northeast should be taken into consideration.

With the cooperation of sugarbush owners too numerous to list, and Cornell Cooperative Extension agents Beth Spaugh and Steve Vandermark, as well as funding support from the USFS, NY State Department of Environmental Conservation (NYSDEC), and Cornell University, 60 permanent study plots were established in 12 sugar bush locations throughout the four most ice damaged counties in northern New York. Sites with differing degrees of ice damage, stand age classes, geographic location, and management were chosen for the study. Initially, it was hoped that sites of existing research, such as the North American Maple Project (NAMP) plot locations or NYSDEC sugar maple decline plots could be used, so as to provide pre-storm data for the project. However, very few of these locations received any ice damage. Thus, all new study plots were established during the growing season of 1998. Initially, 10 sites (5 in Clinton County and 5 in St. Lawrence County) were established. Later, with the notice of additional funding, two additional sites were established, one each in Essex and Franklin Counties. Five permanent plots were placed at each location.

Information collected within the plots attempts to provide a representative picture of pre-storm and post-storm health at each sugarbush location. It includes site history, pre and post-storm management information, and specific tree characteristics indicative of health and vigor. Specific survey components developed by the Ice Storm Damage Assessment Group include individual tree classifications, tree conditions, crown damage estimates, and site information. These components were selected not only to provide a complete picture of pre and post-storm sugar bush health, but also to allow for reliable and efficient data collection. Remeasurement and evaluation of the trees in each plot is scheduled to take place at least once per summer for the next four years and hopefully beyond, if funding remains.

In order to bring sugar bush owners together to share experiences and infor-

mation, two workshops were held—one in each of the counties receiving the most severe damage—St. Lawrence and Clinton County. These programs were a cooperative effort between the USDA Farm Service Agency, Cornell Cooperative Extension, and NYSDEC, and were a success due to the participation of over 75 maple producers. Each workshop highlighted available assistance programs and featured a chain saw safety quick course. After a delicious lunch, factors which may affect tree health over the next several years as well as economic variables were discussed while using the sugar bush sample plots as an outdoor classroom and the trees as subjects to evaluate.

These workshops prompted more questions, resulting in the pursuit of additional study, possibly involving a fertilization study, and exploration of alternative sources of income, such as mushrooms, ginseng, wildlife, and recreation. It is hoped that some of these other "crops" may help fill the economic void left from the loss of trees, the loss of production during the recovery period, and income loss as a result of the January 1998 ice storm.

According to a New York Agricultural Statistics Service May 1998 news release, the number of taps not placed in New York State due to the January 1998 ice storm was estimated at 380,000. This represents about 50 percent of the taps historically placed in those counties effected by the storm. The report also stated that 70 percent of the producers who reported damage plan to tap for the 1999 season, although many were indecisive as to what extent.

General observations and management recommendations concluded thus far are consistent with initial thoughts regarding the damage within sugar bushes. The forests will recover—mother nature can be devastating, but she also is quite resilient. But the woods will certainly look different for a while. Trees will be lost and the number of taps will be reduced during the recovery period ranging from few in the less damaged areas to much greater numbers in the more heavily damaged areas. Pre-storm tree health, vigor, age, management practices, and climactic conditions will all play important roles in how the trees recover. It is interesting to note that while much of New York state was experiencing very dry conditions during the summer months of 1998, the northern part of the state (in the ice-damage region) received more than adequate rainfall. This can only be seen as beneficial for recovery of the damaged trees. Hopefully, this winter's weather conditions will lack severity and next summer's growing season will be favorable.

Producers have been encouraged to respond to restoration of their sugar bushes with as much patience as possible. It is strongly suggested that producers seek help from knowledgeable professional foresters. Every effort should be taken to reduce additional wounding to residual trees during thinning and clean-up of storm debris. These activities should not be practiced during periods of wet soil or freeze-thaw conditions when root systems are more likely to be damaged. Finally, attention to safety remains important due to the numerous hazards of hanging branches and slash underfoot.

Throughout this work, during many visits to sugar bushes spread from Lake Champlain to the St. Lawrence River Valley, I have been amazed and touched

by the courage, resiliency, tenacity, and hospitality displayed by each sugaring family that I've spoken or met with. As a newcomer to the North Country and to the maple syrup industry, I am touched by the courtesies which have been extended to me. In a final note, I have to say that if any group of folks can and deserves to recover from such a catastrophic event—the sugar bush producers from northern New York certainly do. Here's hoping that Mother Nature thinks so too.

The author is a forester with Cornell's Uihlein Sugar Maple Field Station with a major assignment in the ice storm assessment and monitoring program.

Email address: jkoegl@aol.com.



Woods walk for maple producers in St. Lawrence County August 1998 hosted by DEC, FSA, NY Maple Producers Association, and Cornell Cooperative Extension.

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A YEAR AFTER THE ICE STORM— WHAT NEXT FOR NEW HAMPSHIRE PRODUCERS?

By Lucien Blais

It's already been a year since the ice storm of 1998 devastated many sugarbushes throughout maple country. Compared to some other states and provinces New Hampshire fared well with only a small percentage of sugarbushes being affected. Nonetheless, for those affected, the past year has been a time of consultation, evaluation and making hard decisions. We contacted some members hardest hit by the storm to see what their plans are for the coming season.

Up in Colebrook, Lester Brooks has had 2000 taps for about 15 years. Determined to tap this Spring, he spent countless hours digging out his tubing from under snow, ice, trees and limbs. For all of his efforts he made a disappointing 91 gallons; down from his average of 300 gallons. This Spring he will not tap many of his damaged trees but he hopes to bring his tap count back up to 2000 by tapping other trees. At 70 years young he says he's determined not to give up.

Billy Weir did not tap last year and he admits that he was discouraged at first. With the help of several other people, he has spent over a month in the woods cleaning up. By adding a few trees never tapped before he hopes his tap count will be at 1500, down from his usual 2000.

Frank Owen, also in Colebrook,

lost many of his higher elevation trees. Fortunately for him, his granddaughter bought an adjacent woodlot which now gives him access to most of his lower elevation trees never tapped before. He sees no problem returning to his normal production.

Further South in Dummer, Marcel Campbell's sugar bush took the full brunt of the ice storm. Unless he's successful in locating another bush, his tap count this Spring will be down to 300 from 800. His trees were still young and were in need of some thinning, though not quite so drastic. He hopes that, with proper management, he'll be looking at a much healthier sugarbush in ten years from now. He plans to change all of his spouts to the new 19/64 spout to minimize the stress on the trees. He also credits the Farm Service Agency for providing him with the incentive to continue sugaring.

In Berlin, Lucien Blais of Bisson's Sugar House is getting ready for another season. Maple producers who attended last summer's meeting saw first hand the effects of the ice on his trees. He estimates that in his two bushes his tap count will go down from 4000 to 2000. He is in the process of negotiating with other landowners and hopes to lease another 1000 taps from unaffected trees. If time permits he will convert all spouts to the new smaller "health spout." Lucien also finds that the new spout is a good selling point in trying to obtain a lease agreement.

Down in Carroll County, Peter Olkkola is also looking to return to normal production by locating other trees within reasonable distance of his sugar house. This will mean that his

800 or so taps will be spread out a little more. He says that maple sugaring is not easy and ice storms just make it that much more difficult. He has managed to salvage a lot of firewood from cleaning up his sugar bush.

In talking to John Riff of the Carroll and Coos counties Farm Service Agency, he states that he is very happy with the cost share assistance that his agency has been able to provide producers. He feels "the moral and monetary support provided the incentive to get producers back on their feet again." He was impressed

by the producers genuine "love for their way of life." His agency is still working with Washington to get loss of revenue assistance for those producers who were not able to tap last Spring due to the ice storm.

Maple Producers, by their very nature, are as hearty and resilient as the trees they tap. This ice storm may be a major set back but only one of the many challenges inherent in maple sugaring. It was heartwarming to talk with these people about their future plans. We wish all affected producers the best for the coming season.

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THE AFFECT OF SOIL CALCIUM TO ALUMINUM RATIO ON SUGAR MAPLE SEEDLINGS

By M.C. Demchik
and W.E. Sharpe

INTRODUCTION

Regeneration of many species of northern hardwoods is difficult in Pennsylvania due to the impact of deer browsing and hay-scented fern competition. However, even on sites where these factors have been controlled by deer fencing and herbicides, regeneration of some species, such as sugar maple, have disturbingly low success rates. Unpublished data suggest that ridge-top sites present especially difficult sugar maple regeneration problems. Ridge-top sites are lower in available soil nutrients and higher in available aluminum, an element that is toxic to sugar maples in relatively low concentrations.

Even though ridge-tops formerly supported sugar maple, they now seem incapable of doing so. We believe both soils and stand conditions are not the same as they were when the current forest was established. Historically, acidic deposition, logging and the leaching of soil nutrients caused by these disturbances contributed to a reduction in some soil nutrients (particularly calcium, magnesium and potassium) and increased available aluminum to stressful levels. Declining overstory sugar maples are not replaced by young sugar maple seedlings and

there is a nearly complete absence of young sugar maples in these ridge-top stands.

Sugar maple seedlings face enormous stresses. Under normal circumstances, only 5 percent or less of sugar maple seeds that germinate produce a one year old seedling. We hypothesized that sugar maple seedlings were simply unable to become established with the additional stress imposed by poor soil fertility. Therefore the purpose of this study was to determine if soil calcium to aluminum ratio (an indicator of this stress) was related to seedling presence, root characteristics, growth and survival.

METHODS

Study 1: The effect of calcium to aluminum ratio on the presence of sugar maple seedlings.

Eighteen Pennsylvania sites were selected in an attempt to encompass a wide range of soil calcium to aluminum ratios. These sites were in Potter Co. (11), Westmoreland Co. (1), Sullivan Co. (2), Huntington Co. (3) and Centre Co. (1). Three round (75 cm diameter) plots were established at each site and all sugar maple seedlings in these plots were counted. Samples of the soil (organic layer, A-horizon and B-horizon) were taken from each plot. Soil pH, available calcium, aluminum, manganese and calcium to aluminum ratio were determined for each soil. The level of these nutrients in soils where seedlings were present was compared to the levels of nutrients in soil where no seedlings were present.

Study 2: The effect of calcium to aluminum ratio on root characteristics.

Ten sites were selected from sites

containing sugar maple seedlings. These sites were in Potter Co (7), Huntington Co (1) and Somerset Co (2). Plots were selected that contained a minimum of 50 sugar maple seedlings. Samples of the soil were taken and analyzed as before.

The fine roots (<1mm diameter) from 10 sugar maple seedlings were separated from the intact root systems. Roots from the organic layer and roots from the mineral soil were pooled into different samples. Roots were cleaned and analyzed for minerals present.

To establish if levels of "helper fungi" [called vesicular-arbuscular mycorrhizae (VAM)] were high (an indicator of a healthy seedling), seedlings were collected from each site and the number of roots that had helper fungi was compared to the number that did not.

Study 3: Survival and growth on sites with no natural sugar maple regeneration.

Within the Susquehannock State Forest, Potter County, PA, one stand of northern hardwoods with high rates of sugar maple mortality and no seedlings (HIGH) and one stand with lower rates of mortality and numerous seedlings (LOW) were selected. The HIGH stand had very low calcium to aluminum ratios (poor soil fertility) and the LOW stand had much higher calcium to aluminum ratios (better soil fertility). Seedlings were transplanted into both plots (in areas that were hand weeded to limit fern competition and fenced to eliminate deer browsing) and growth was monitored. After 2 years, the total root growth was measured.

Because different stand conditions (more light because of dead trees etc.)

may affect seedling growth, this same experiment was conducted in a greenhouse with soils from the two sites.

RESULTS AND DISCUSSION

The soil on sites with seedlings had greater levels of calcium (a soil nutrient), greater calcium to aluminum ratio (better ratio of soil nutrient to soil toxin), lower levels of manganese (a soil nutrient at low levels but a toxin at high levels) and greater pH (not as acidic). This means that sites that naturally regenerated seedlings had better soil fertility. This result agrees with the observation of poor regeneration of sugar maple on ridge-tops but better regeneration on lower slopes. Soils on the lower slopes usually have better soil fertility than soils on the upper slopes.

Level of calcium to aluminum ratio in the roots of seedlings was related to level of calcium to aluminum ratio in the mineral soil. This is not surprising, because seedlings get their nutrition from the soil. However, it means that seedlings may be likely to experience toxic effects of aluminum if the mineral soil has high levels of available aluminum.

The percentage of the roots with "helper fungi" ranged from 7-53 percent. The greater the ratio of calcium to aluminum, the greater the percentage of helper fungi. This means that seedlings on better sites also had "helper fungi" to increase their uptake of soil nutrients. Therefore, better soil fertility may translate into a greater chance of survival.

Seedlings planted in the soil with low calcium to aluminum ratio had almost no growth, 70 to 100 percent leaf damage and high rates of mortality.

ty (67 percent in the field and 71 percent in the greenhouse). In general, these seedlings appeared to be in exceedingly poor health. Seedlings planted in soil from the site with better calcium to aluminum ratio had some growth, 0 to 70 percent leaf damage and lower mortality (20 percent in the field and 21 percent in the greenhouse). Overall, these seedlings were normal in appearance.

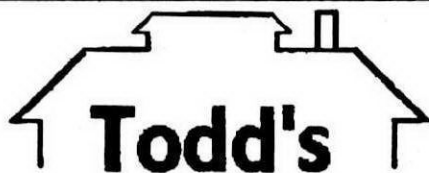
SUMMARY AND CONCLUSIONS

Sugar maple seedlings were not found on soils with high levels of plant available aluminum and low levels of calcium to aluminum ratio. The higher the ratio of calcium to aluminum, the more helper fungi were present. Seedlings grown in soils with low calcium to aluminum ratios and a history of overstory sugar maple mortality were subject to high rates of mortality, low growth and overall poor health. When the factors of deer browsing, fern competition, soil moisture and

light were controlled in the greenhouse, seedling growth was still poor and mortality was high. We believe this was due to the very low soil calcium to aluminum ratios. The low soil calcium to aluminum ratios prevalent in the sugar maple stands that we studied appeared to severely restrict seedling success. Consequently, if sugar maple is desired in the regeneration of sites with low levels of calcium and high levels of aluminum (like many ridge-top sites in Pennsylvania), liming and possibly fertilization will be required to improve soil fertility.

ACKNOWLEDGEMENTS

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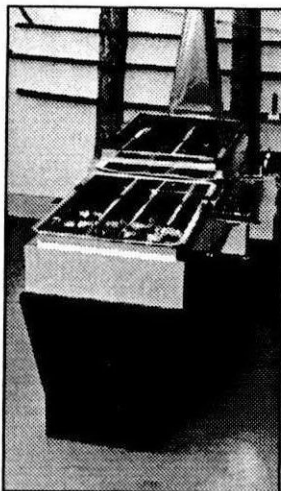
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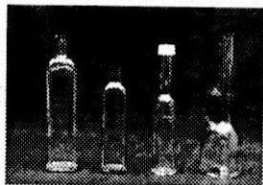
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The I.M.S.I. has begun the random selection and testing of all 100% pure maple syrup products that are sold throughout world markets. Product is being purchased, off the shelf, in markets around the world. This product is then submitted to an independent scientific laboratory for analysis. All products will be tested for adulteration

by non-maple sugars. Samples that are found to be adulterated, will be turned over to appropriate government authorities for further investigation and prosecution.

Scientific tests for adulteration, with a wide range of non-maple sugars, have been developed in a partnership between the I.M.S.I. and a private laboratory in France. Testing will also confirm the origin of the sugars involved and the origin of the maple sugars. Several years in development, this test has already been used successfully in United States court actions.

International Maple Syrup Institute members are asked to communicate this action to their customers in world markets. Anyone with questions on this program should contact the I.M.S.I. for further information.

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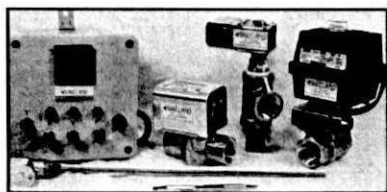
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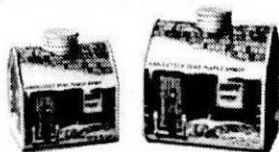
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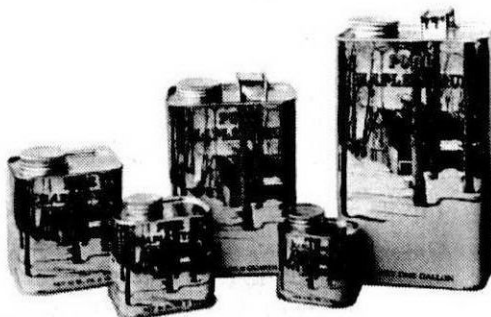
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WHAT EVERY SUGARMAKER SHOULD KNOW ABOUT THE ASIAN LONGHORNED BEETLE

By Bruce Parker

Professor of Entomology University of Vermont

and Margaret Skinner

Assistant Professor Entomology University of Vermont

1. The Asian longhorned beetle (ALHB) was first discovered in two sites in the New York City area in 1996.
2. Over 2,000 trees have been cut down and destroyed to eradicate ALHB from New York, and more will be cut down in the future. Additional infested trees have been found near the original infestation sites. Surveys will continue for several years and all infested trees will be destroyed until no beetles are found.
3. ALHB was discovered in Chicago in three different areas in July 1998. Several hundred trees will be removed. Surveys will continue for several years and infested trees will be destroyed until no beetles are found.
4. Effective survey methods have not been developed which has resulted in infested trees going undetected.
5. ALHB usually enters the U.S. in solid wood packing materials (pallets, crates, dunnage, etc.) used in shipments of pipe, granite blocks, and heavy machinery.
6. ALHB and other related species have been intercepted in warehouses in Pennsylvania, Michigan, Wisconsin, Illinois, Ohio, California, Texas, New Jersey, South Carolina, North Carolina, Florida, Washington, Indiana and New York.
7. Sugar maple is a favored ALHB host. They also feed on other maple species (e.g., Norway), birch, horse chestnut, willow, poplar, ash, black locust, apple and more.
8. ALHB kills trees, sometimes in less than three years. Limbs weakened by ALHB feeding are a risk in sugarbushes as well as urban and suburban areas.
9. Based on its distribution in China, researchers believe that ALHB is able to survive climactic conditions that exist from southern Canada to Virginia.
10. Over \$5 million has been spent so far on eradicating the Asian longhorned beetle.
11. All ALHB infestations are believed to have originated in China, though this beetle occurs in other Asian countries as well.
12. No effective chemical or biological control methods are currently known.
13. A regional public awareness program will be coordinated by the University of Vermont and the VT Depts. of Forests & Parks and Agriculture to inform the public about this beetle (funded by the U.S. Forestry and APHIS). We hope additional infestation, if they exist, will be detected promptly.
14. ALHB is not known to be established in any states except New York & Illinois.
15. The U.S. Department of Agriculture has proposed an Interim Rule to require that all solid wood packing material be treated prior to shipment to the U.S. to reduce the risk of the entry of this beetle.

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A SPECIAL PERSON

The old saying, "It's never too late," brings me to the situation we are now in. The Hall of Fame Committee for the North American Maple Syrup Council has taken this situation to heart. Long overdue and immediately important, the committee decided that the name of Florence Lamb be presented for nomination to the Maple Hall of Fame in Croghan, New York, next May.

The team of Bob and Florence Lamb has been with us for nearly fifty years. Over the years Bob was recognized as a prominent force in the production and promotion of our great product. It is now time to say "THANKS" to the other member of this team. Florence has always worked and supported Bob in his efforts in maple.

The past has given us glimpses of this dedication. In the October 1985 *Maple Syrup Digest* the late Adin Reynolds presented a poem entitled:

"A Belated Recognition"

We often visit places
Viewing walls hung with plaques
Inscribed with words of honor
And all supporting facts

Describing a famous person
And of course the work they're in
Listing deeds of merit
And talents sure to win

But we know of other folks
Perhaps far more deserving
For their generous contributions
In the field that they are serving

Folks that notice others
Granting them attention
Yet their own achievements
They always fail to mention

Like supporting worthy causes
And setting up foundations
Funding new ideas
And providing inspirations

Perhaps it's time we noticed
Give some credit to folks like these

Show our appreciation
And look beyond our trees

There is one special couple
That has room upon their wall
For a long neglected plaque
And coming from us all

These two special people
A pair we all know
None other than the LAMBS
Of course it's Bob and Flo

They've spent much time in Maple
And their dedication shown
They've helped us all with problems
When they had problems of their own

We can say our words of thanks
But that's not quite the same
Perhaps not so quick forgotten
If mounted in a frame.

**OUR THANKS
THE MAPLE SYRUP INDUSTRY**

By Adin Reynolds

In 1990 an honorary story was printed in the program of the North American Maple Syrup Council when it met in Batavia, New York.

BOB & FLORENCE LAMB

With extreme pleasure we recognize Bob and Florence Lamb for their many years of dedicated service to the maple industry and The North American Maple Council.

Bob and Florence have attended every council meeting since its inception, always willing to contribute whatever has been necessary to make the meetings successful.

Bob was a successful businessman for many years selling chainsaws, milk coolers, boats, campers and many other items necessary to our society. Someone along the way suggested to Bob a new collection system was necessary for the maple industry. Bob began experimenting with plastic tubing, finally finding something that would work. This got Bob and Florence involved with the maple people whom they thoroughly enjoy being with.

As time went on Bob and Florence felt that people who had dedicated a lot of time to maple should be recognized and they created a fund to recognize those people whom they thoroughly enjoy being with.

Seeing a need for a permanent building for the American Maple Museum, Bob and Florence purchased an abandoned school in Croghan, New York and donated it to the American Maple Museum.

The museum has many artifacts of the maple industry and at least two people have been inducted into the Hall of Fame each of the past several years.

Bob and Florence decided in the mid-70's to move to Bernhard Bay, NY and install their own tubing extruder. Working around the clock for many days in a row they produced tubing for the maple industry. Thinking they were getting to old to work around the clock they sold their business but continued to operate it for several more years. Finally the business was sold again and the extruder was moved to Rutland, VT where it is still operated, but Bob and Florence do not have to stay up around the clock anymore!

While involved in all these activities they found time to raise a family and travel to many maple meetings around the United States and Canada.

Thank you Bob and Florence for all you have done for the maple industry in New York and for the North American Council. We appreciate it.

The committee asks that all who can, attend the installation ceremony at the American Maple Museum to honor Florence. Realizing that her health may be a factor relative to her attendance we wish her good health. Also there will be the plaque presentation to Mel Koelling who was unable to attend his installation two years ago.

The opening of the museum for 1999 is May 15, 1999. A great pancake breakfast starts the program with Maple Queen and Hall of Fame induction to follow. The program is culminated by a parade through the village of Croghan. Of course the museum will be open to all, where the history and future of maple are preserved for our enjoyment and education.

Anyone wishing to take part in the induction ceremony for Florence Lamb should contact Russ Davenport, 111A Tower Road, Shelburne Falls, MA 01370.

Sincerely,

Russ Davenport and the Hall of Fame Committee

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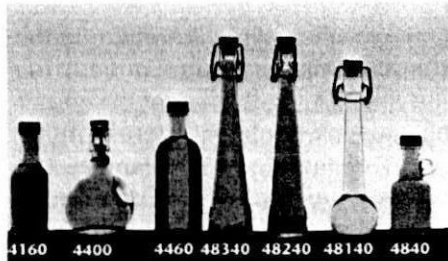
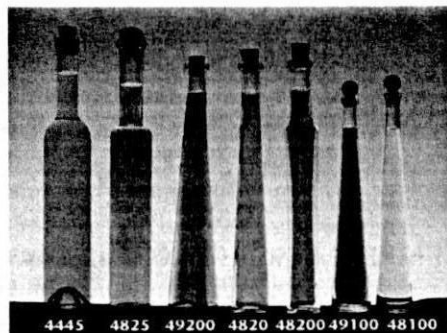


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INDIANA MAPLE SYRUP ASSOCIATION ANNUAL MEETING

By Steve Deatline

The Indiana Maple Syrup Association met in Gaston, IN on Saturday, December 5, 1998 for their ninth annual meeting. Organized in 1990, IMSA has shown steady growth through members' involvement in the Indiana State Fair Pioneer Village and through increased awareness by the public of the historically-important Maple Industry in Indiana. Fifty-two producers heard Rick Lloyd of Wellsboro, PA, talk about all aspects of maple production, from the first-time tapper to quality control and marketing for the seasoned producer.

Florence Williams, Rockville, IN, president, discussed her visit to the annual meeting of the NAMSC (North American Maple Syrup Council) in Titusville, PA, in October of this year. She was particularly interested in reports of the ice storm damage to maples in our northeastern states.

Greg Yapp of the Indiana Division of Forestry discussed with members the increased threat of gypsy moth to Indiana forest growers/users. At present, Stueben County is under quarantine because of gypsy moth infestation. He outlined steps to prevent the spread of gypsy moths and long-horned beetles. Members discussed the feasibility of removing oaks, which would be the first threatened species of tree as gypsy moths moved into an area, as opposed to leaving them to delay attacks on producing maple trees. Larry Yoder of Merry Lea

Nature Preserve, part of Goshen College, Goshen, IN, showed slides and spoke on "value added" syrup operations: marketing knowledge, skills, and entertainment as part of syrup production.

Members plan to meet June 21, 1999, to can syrup for the Indiana State Fair and June 28, 1999, to begin renovation of Sugar Shack at the fair grounds.

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Research at the Collège d'Alfred Looks at Solutions for Maple Tubing Contamination

By

*Pierre-Alain Blais and Claudine Pagé
Collège d'Alfred
University of Guelph, Ontario*

Maple syrup production has undergone significant changes over the years. Traditionally, the abundant maple sap was collected in buckets and transferred to a reservoir that was hauled to the sugar house where it was boiled to make syrup. However, with increasing production demands, more efficient methods were sought. Plastic tubing systems connected to vacuum pumps are often used to minimize labour costs and increase productivity of large operations. But these advances in maple technology brought new challenges for producers in the area of sanitation. In the spring 1998, a research project was initiated at the Collège d'Alfred, supported by the following partners: Ontario Maple Syrup Producers Association, Ontario Ministry of Agriculture, Food and Rural Affairs, Eastern Ontario Model Forest Group, and CDL Maple Sugaring Equipment Inc.

Tubing collection systems may become so contaminated by microbes that the market value of the final products is diminished. High levels of microbial contamination in the sap result in darker, stronger tasting syrups. Koelling and Heiligmann in the *North American Maple Syrup Producers Manual* estimate that

"microorganisms contamination of the sap is a major cause of low-quality syrup, causing darker grades and often causing undesirable flavours, and can also shorten tap hole life by blocking sap flow" (p.51, 1996). There can be a premium paid for lighter grades of syrup.

Because maple sap contains simple sugars, amino acids and minerals, it is an ideal growth medium for microbes. The dark plastic collectors enhance sap microbial growth when warmed by sunlight. Their inner surfaces may become coated with microbial contamination that infects the sap. Microbial population levels are very difficult to manage, especially when a faulty installation allows dips or sags along the lines between supports. Sagging prevents the complete drainage of the line section, which also promotes microbial growth. Sap should flow quickly and directly to the bottom of the lines. Therefore, a thorough inspection of the lines should be performed regularly.

Diluted chlorine bleach is currently recommended for sanitizing maple tubing systems. While it helps to produce lighter grades, it can leave undesirable residues in the syrup as well as in the environment. To ensure a pure maple product, the first sap flow is often discarded after treatment. These limitations have made maple syrup producers seek more acceptable, yet efficient sanitation and cleaning methods.

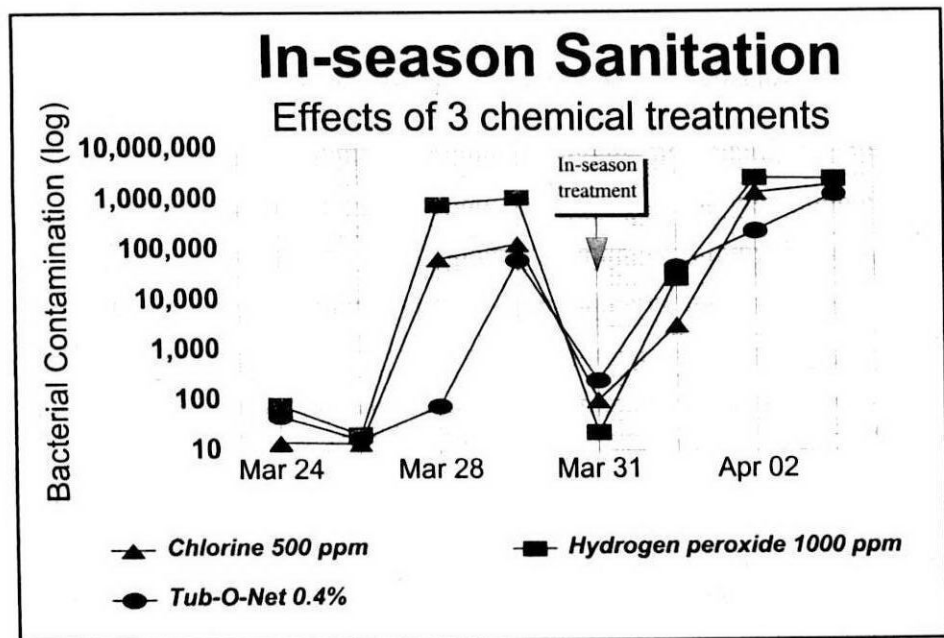
In order to develop better solutions for maple producers, the Research and Technology Transfer Services of the Collège d'Alfred initiated a research project last spring. An experimental network of plastic tubing was

installed in the Collège's sugarbush. Four independent and comparable collection lines were placed in a section of the bush which had sustained light to moderate damage from the memorable January Ice Storm. This created a typical sugar bush operation setting where the effectiveness of sanitation methods could be tested. The goals of this project were to increase the proportion of high quality syrup produced during the whole season, while maintaining clean sap collection equipment.

In-season sanitation efficiency was tested with short contact time (10 minutes) and diluted chemicals. Four sanitation methods were evaluated: chlorine bleach at 500 ppm, hydrogen peroxide at 1000 ppm, Tub-O-Net® at 0.4% and water wash with air injection. A 500 ppm bleach is obtained by diluting ½ L of 10%

bleach in 100 L of water. Each treatment was immediately followed by a water rinse to ensure that no residues were left in the tubing. The results obtained after the treatment during the season showed that all diluted chemical disinfectants reduced the microbial contamination by more than 99%. Chlorine bleach used at the low concentration of 500 ppm could therefore be used to help produce quality syrup. However, the water wash with injected air use as an in-season treatment did not show any positive results, with the experimental setup used.

The experimental setup that was installed will allow future studies based on these preliminary findings. It is proposed to further test the four sanitation methods as well as include ozone as a possible treatment for maple tubing. In addition, the effi-



ciency of the chemicals and methods, will be tested for the final end-season cleanup. Several promising alternative treatments have been identified that could help produce high quality syrup while preserving the environment.

For further information, please contact Dave Chapeskie, R.P.F., OMAFRA Provincial Agroforestry Specialist, (613) 258-8302, or Pierre-Alain Blais at the Collège d'Alfred - University of Guelph, (613) 679-2218 x-602.

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MAPLE SYRUP DIGEST INDEX

(Continued from the June 1998 issue)

The purpose of this index is to inform our readers of articles published since the beginning of the Digest. If you see an article you would be interested in and don't have that Digest we will send you the issue at a cost of \$1.00 per issue.

- DEC. 1985** Maple Survey Conducted by the Research Committee of NAMSC
NAMSC 26th Annual Meeting (Girard)
- FEB. 1986** Dedication Issue—The Drummonds of Spencerville Maple Syrup
Makers Since 1817
Tap Roots—Tapping Trees
- OCT. 1986** IMSI Annual Meeting
Maple Prices (Majszak)
The Forced-Draft Wood (Grate, Sendak, Laing)
1986 NY Maple Tour
Lecanium Scale (Majszak)
Limiting Injury in Sugar Maple Due to Tapping (Garrett, Funk)
Tap Roots—What Controls Sugar Content
- DEC. 1986** Tap Roots—Syrup Color
Quality of Syrup Produced From Sap Collected from Declined
Maples (Morselli, Whalen)
Your American Maple Museum (Schneider)
1986 NAMSC Convention
- FEB. 1987** A Great Taste of Massachusetts
Mark an "Early Budder"
Tap Roots—Tubing System for Beginners
Thinning Guide for Developing Desirable Sugarbush Trees
Voorhis)
- JULY 1987** Hall of Fame Inductees
Fall Cankerworm Defoliation Warrants a Watchful Eye
(Allen, Staats)
Tap Roots—Rain (Guard)
Tapping Guidelines (Buzzell)
- OCT. 1987** Testing Relative Sweetness among Young Sugar Maples (Staats)
Tap Roots—The Column for Beginners—Maple Cream
- DEC. 1987** "Salty" Syrup from Roadside Sugar Maples in Decline
(Morselli, Whalen)
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Vermont Committee Compiles Maple History
History of American Maple Products Corporation, Est. 1935
(Doubleday)
- FEB. 1988** Sap Prices
Maple Syruping in Iowa (Patterson)
Bob McConnell
Adin Reynolds
Environmental Stress on the Sugar Maple by the Year 2000 May
Affect Sap Biochemistry, Hence Syrup Grades (Morselli)
Tap Roots—Syrup Density
- JUNE 1988** I Question Acid Rain (Andersen)

- Fire Destroys Proctor Maple Research Center
 Our Maples Are Dying (Scanlon)
 New Producers Mean Bright Future for Ohio Maple Industry
 (Passewitz, James)
- OCT. 1988 Tap Roots—Sugar Sand
 American Maple Museum Hall of Fame (Arthur Merlie, Jr.,
 Paul Richards)
 Pear Thrips damage to Vermont Sugar Maples 1988 (Parker)
 Sugar Maple and the Pear Thrips (Palm)
- DEC. 1988 Tap Roots—Filtering
 The Controversial Tap Pellet
 Pear Thrips A Threat to North Eastern Sugar Maple (Laudermilch)
 1988 North American Maple Council Convention (Reynolds)
 Marketing of Your Maple Products (Donovan, Staats)
- FEB. 1989 Research Proposal Guidelines
 Sap Prices
 NAMSC Technical Session
 A Tribute to Mrs. Florence Running (Beard)
 Tap Roots—Maple Sugar Cakes
 Increased Profits Through 31% Reduction in Energy Consumption
 (Donnovan, Staats)
- JUNE 1989 More on the PFA Pellet (Laing)
 Pear Thrips Conference Held
 A Tribute to Maple Maids in an Unique Agricultural Industry
 (Doubleday)
 Critical Characteristics of New York State Maple Syrup
 Producers: Socio-Economics, Tradition, and Personal
 Expertise: Part One (Tucker, Tucker)
 Paul Smith's College: A Sweet Place to Study
 Vermont Sugar Makers Assoc. Almost 100 (Foulds)
- OCT. 1989 American Maple Museum Hall of Fame (Humphreys)
 Looking Back (Winch)
 Leader Evaporator & G.H. Grimm Companies Merge
 Cornell Completes Final VCE Evaluation (Kelley, Staats)



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- Characteristics of New York State Maple Producers: Expertise:
Part Two (Tucker, Tucker)
- DEC. 1989 Syrup Layering and Darkening During Storage (Morselli, Whalen)
Fred Winch Sugar Maple Tree Dedication
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Selecting "Sweet" Sugar Maple Trees (Garrett, Dudzik)
Tap Roots: Marking Trees for Tubing
- FEB. 1990 Maple Research Publications List (Whalen, Morselli)
University of Vermont Abbreviated List of Publications on Maple
Research (Whalen, Morselli)
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- JUNE 1990 Pear Thrips Update Entomology Research University of Vermont
(Parker, Skinner)
Lazy Sugarmakers Stack Top (Parker)
Highlights in the History of the Cary Maple Sugar Company
(Doubleday)
Pear Thrips Threaten Maple Sugar and Cherry Wood Industries
Cause of Maple Dieback Takes New Tack: Research Points
Finger at Global Warming
- OCT. 1990 A Tribute to Lloyd Sipple (Sage)
Marketing Maple Syrup Requires Strategy (Taber, Kelley, Staats)
A Soil Fungus for Control of Pear Thrips (Yuill, Parker)
Vermont Maplerama Held (Foulds)
How to Grow Healthier Maple Trees: Exp. Sta., Randor, PA
Your American Maple Museum (Induction of Foulds, Fress)
(Sneider)
Ag. District Law Applies to Christmas Trees, Sugarbushes, and
Woodlands in NY (Taber, Gills)
In Memorium, Orlando W. Small
- DEC. 1990 1990 North American Maple Syrup Convention (Vogt)
Vermont Embarks on Significant Biological Control Research for
Pear Thrips Management (Parker, Skinner)

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- FEB. 1991** In Memorium, Ruth M. Bascom
Ohio Maple Producers Fall Tour (Hoffman)
Cornell's John Kelley Wears Many Hats
Tap Roots—Marketing
1991 Sap Prices
- JUNE 1991** In Memorium, Howard S. Taylor
Recent Developments in the Biological Control of Pear Thrips
(Brownbridge, Yuill)
Marketing Tips: Using Samples to Increase Sales (Kopp)
Study Shows Biodegradable Plastics Do Not Biodegrade
1991 Hall of Fame Inductees—Ed Doubousta, Iona Patterson.
More Thoughts on Containers for Marketing Maple Syrup
(Doubleday)
- OCT. 1991** Should We Forget Pear Thrip? An Update from Vermont
(Parker, Skinner, Teillon)
On the Maple Trail: On the Trail of Something Good (Dearborn)
Your American Maple Museum (Hall of Fame Inductees:
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The Maple Sugaring Story around the World
Ohio State University Co-op Extension Service Looks at Keeping
Maple Syrup Markets Healthy (Drake, James)
- DEC. 1991** Maple and the Bicentennial (Foulds)
IMSI Holds Annual Meeting at Eau Clair
From Pink Pear Thrips to . . . Continuing Biological Control
in Vermont (Brownbridge, Parker, Skinner)
1991 NAMSC Convention (Vogt)
- FEB. 1992** Maple in the Soviet Union (Jorns)
Strategic Plan for the Ontario Maple Syrup Producers' Assoc.
USDA to Estimate Maple Syrup Production and Prices in 10 States
Clean Tapping Improves Maple Syrup Quality and Keeps the
Tree Healthier (Morselli, Whalen)

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At Least the Sap Is Free (Young)
Marketing Tips (Kopp)
Fungus that Slaughters Gypsy Moth Caterpillars Proves Its Worth
(Hajek)

- JUNE 1992** Can Pear Thrips Fungal Pathogens Be Used Against Other Maple Pests? (Martinez de Murguia, Brownbridge, Parker)
Tapping Guidelines and Tree Diameter (Staats, Kelley)
NAMSC's 1990 Technical Session Proceedings Now Available
Letter to Mrs. Ruker (Reynolds)
History: Eaton & Eaton, Inc., South Royalton, VT (Foulds)
Government Announces Latest Version of Maple Syrup Marketing Committee (Zandbelt)
- OCT. 1992** Proposal for National Maple Syrup Board (McLure)
Sugar Maple IPM (Parker, Skinner, Brownbridge)
1992 Ohio State Fair (Hoffman)
Your American Maple Museum (Schneider)
Maine News (Schmidt)
American Maple Museum Hall of Fame (Sipple, Kopp)
Minutes of IMSI Board of Directors Meeting
Notes from Vermont (Foulds)
OMSPA Annual Meeting
- DEC 1992** Marketing Tips (Kopp)
Is There Anything Else Out There? (Brownbridge, Adamowicz)



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Ohio Fall Tour (Hoffman)
IMSI Conducts Annual Meeting in Ohio
Nova Scotia Fall Tour (Allaway)
1992 NAMSC Annual Meeting and Convention
Tenth Annual Maple Syrup Festival (Patterson)
Putting on the Tour (Aldrich)
Wisconsin Maple Tour (Hauge)

FEB. 1993

Refinement of the Use of Visual Traps to Predict Potential
Damage to Sugar Maples from the Pear Thrips (Coli,
Hollingsworth)
National Maple Syrup Council Second Annual Meeting
(Zimmerman)
The Future of Sugar Maple vs. Insects and Diseases (Finley,
Anundson)
Proctor Maple Research Center University of Vermont Maple
Syrup Study (Williams)
Your American Maple Museum (Schneider)
Sugar Maple IPM (Parker, Skinner, Brownbridge)
News from Indiana (Garner)

JUNE 1993

A Pause for Thought about Pear Thrips (Skinner, Parker,
Brownbridge, Teillon)
Maine News (Schmidt)
Your American Maple Museum (Schneider)
Effects of Prior Pear Thrips Damage on Sap and Crown
Characteristics of Sugarbush Maples (Kold, McCormick)
News from Massachusetts (McCrumm)
1993 Ohio Maple Institute (Hoffman)
Survey Results
64th Geauga County Maple Festival (Hoffman)
Vermont Maple Sugarmakers' Association Celebrates 100
Years (Foulds)



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A lot of people have requested that we publish sap prices. What I have found is that sap prices vary greatly depending upon the retail price of syrup. The retail price of syrup in the Northeast is higher than in the Midwest, hence the price paid for sap is higher in the Northeast. Listed below are sap prices being paid by SOME producers.

Remember these prices are for sap delivered to the sugarhouse.

These prices are intended to be used only as a guide for buying sap and no way intends that they dictate the price for the entire industry.

sugar	\$/gal.	sugar	\$/gal.
1.50	.105	3.60	.411
1.60	.124	3.70	.425
1.70	.143	3.80	.440
1.80	.159	3.90	.453
1.90	.174	4.00	.467
2.00	.190	4.10	.480
2.10	.203	4.20	.495
2.20	.217	4.30	.509
2.30	.232	4.40	.522
2.40	.245	4.50	.536
2.50	.259	4.60	.550
2.60	.272	4.70	.564
2.70	.287	4.80	.478
2.80	.301	4.90	.591
2.90	.314	5.00	.606
3.00	.328	5.10	.619
3.10	.342	5.20	.633
3.20	.356	5.30	.647
3.30	.392	5.40	.661
3.40	.383	5.50	.675
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Contact: Alice Potter, PO Box 1 Warkworth, Ontario K0K 3K0

Telephone: 705-924-2057

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Saturday & Sunday, March 13th & 14th, 1999

For more information contact:

Barbara or Selden Wells 860-228-9503

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REMINDER Research Proposal Guidelines

Research projects may be submitted for consideration based on the following guidelines:

(1) Proposals must be received no later than July 1, 1999 for consideration in 1999. Proposals received after that date will be considered in 2000.

(2) Proposals shall be complete and detailed in content. However, proposals shall contain a short concise cover statement briefly explaining cost, scope, objective, procedure, and anticipated value to the maple industry.

(3) Proposals shall contain detailed estimated cost breakdown, within the detailed report.

(4) Proposals shall be submitted with a minimum of forty (40) complete copies.

(5) Proposals must contain a complete reference section listing and explaining any similar or duplicating research previously accomplished. Proposals for duplication of previously completed research must contain detailed explanations of why such duplication is warranted.

(6) Results or progress of funded projects must be presented annually at the convention of the NAMSC and must be published in the Maple Syrup Digest as soon as possible after completion.

(7) Send proposals to: Richard Norman, Research Committee, North American Maple Syrup Council, 387 County Road, Woodstock, CT 06281.

Remember: July 1 Deadline.

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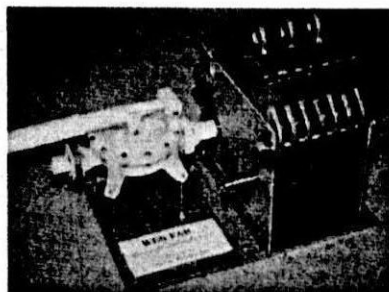
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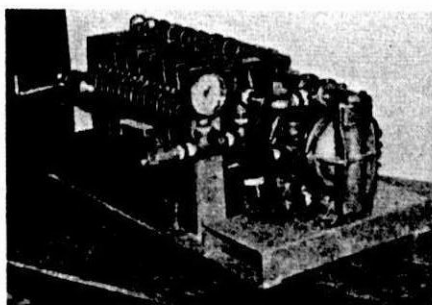
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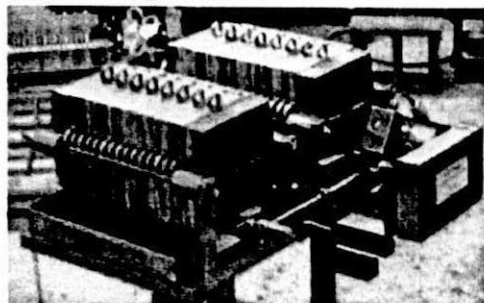
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