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MAPLE SYRUP DIGEST

Official publication of the NORTH AMERICAN MAPLE SYRUP COUNCIL

DIRECTORY

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COVER: 2004 Maple Hall of Fame Inductees: Larry Myott & Steve Selby

GREETINGS FROM YOUR PRESIDENT

The production season should be over by the time you read this. It appears that the season ranged from fair to excellent depending on your location. The quality was outstanding with a lot of light and medium maple syrup made. We must continue our marketing efforts to help keep the surplus in check.

We have encountered some problems with poor quality and misgraded maple syrup being put on the market. It is essential if you suspect that there are any bad products on the shelf, you should call the inspection officials in your state or province. Those officials have the power to get the poor product off the shelves.

The plans for the NAMSC and IMSI meetings October 17th - 20th 2004 at the Roaring Brook Conference Center in Lake George, New York are nearing completion. A number of interesting technical sessions are being planned. A dinner cruise on beautiful Lake George is scheduled as well as several area sugarhouse tours. Remember that the annual New York State tour is being held in conjunction with these meetings. The registration notices will be mailed soon if you haven't already received them.

The maple weekend and open houses held in March were extremely successful despite some bad weather is some areas. The open houses are doing a great job in introducing maple to new people as well as keeping our usual customers up to date on new techniques and products.

Make sure to volunteer for any promotional activities in your local areas. You will meet a lot of interesting people that will hopefully become steady maple consumers.

We have an updated e-mail address: sagemaple@frontiernet.net.

Enjoy your summer and make plans for next years maple season.

Sincerely,
Roger C. Sage

LETTER TO THE EDITOR

Roy,

This is probably worth mentioning in the Maple Digest: Several sources describe Box Elder (Acer negundo) as either marginally worth tapping or not worth tapping.

For whomever decided that, I wonder what time of the sap season they tested the brix of Box Elder sap. I suspect it was tested early in a sap season because that is when it contains the least sugar. Unlike Sugar Maple, for example, that tends to produce the highest sugar content early in the season, Box Elder starts low, then produces its highest sugar content late in the season. For the Box Elders that I tap, a late-season brix of 4.0 is not unusual and the over-the-season average brix is frequently the same as with Sugar Maple.

Sincerely yours,
Jim Fruth

IMSI NEWS

By Larry Myott
Executive Secretary

Letter About Chemically Lightening Maple Syrup

It came to the attention of the IMSI board of directors late last year about a process that was being used to decolorize darker grades of maple syrup and make them a higher grade. After considerable investigation, the board met with researchers and others to determine a strategy to deal with this issue.

I wrote in agricultural magazines during the winter that crooks will find a way to be crooked. That is the same in the maple industry. The following letter was prepared and sent to packers throughout the maple world. If you have any questions on this issue or any other IMSI issue, please contact me, by email at Larry.Myott@uvm.edu or by mail at IMSI, 5014 Route Seven, Ferrisburgh, VT 05456.

"To all packers and producers of Pure Maple Syrup

In recent months it has come to the attention of the International Maple Syrup Institute board of directors that a process has been developed to artificially enhance the grade of Pure Maple Syrup by decolorizing darker grades of maple syrup. Maple syrup by definition is the product of the maple tree, pure and natural, made from the pure maple sap of the maple tree.

Artificial decolorizing is a prohibited act with regulations in both countries strictly prohibiting such actions. Any product that is added to maple syrup would make it adulterated and therefore subject to legal action by the governments of both Canada and the United States. Any syrup that has been decolorized and found positive in tests will likely be seized by government agencies and destroyed. Those found guilty of such action, would likely serve prison time, being punished to the fullest extent of the law.

With the help of the Proctor Maple Research Center at the University of Vermont, we are in the process of developing tests to verify this type of adulteration, results are very promising. As soon as these tests can b' proven, action will be taken to prosecute any packer or producer that is found to be using such methods to enhance the grade of syrup by artificially decolorizing maple syrup. Dr. Timothy Perkins, director of the Proctor Maple Research Center, reports that his center has been funded by the U.S.D.A. and the North American Maple Syrup Council to develop a test that will detect such a process. He noted that they expect to have at least one definitive laboratory test and one simple procedure that "bulk buyers of syrup can use to screen maple syrup for the use of decolorizing resins.

If you should have any questions, please do not hesitate to contact the International Maple Syrup Institute at the above address."

Maple Syrup Food Safety Manual

The Ontario Ministry of Agriculture and Food has released a book that will be a big help to maple producers improving their technology and food handling practices. Titled, Maple Syrup Food Safety Manual, this loose leaf notebook style manual is available for the sum of $22 US or Canadian.

This manual contains a wealth of useful information for sugarmakers, packers, candy makers and all segments of the maple industry. You can learn about how contaminants get into your syrup and step-by-step ways to keep them out, beginning in the sugarbush and ending with the retail syrup container. You'll learn effective pre-season, in-season, and post-season, cleaning and sanitation procedures that will produce safer, higher quality maple syrup.

For many years I was preaching the coding, identification and record keeping of maple production. This manual will show how to do it and provide sample forms that you can copy to use in your own business.

For U.S. purchasers send a check for $22 US, for Canadian purchasers, send a checque for 22$ CN to: Foods of Plant Origin/Food Inspection Branch, Ontario Ministry of Agriculture and Food, 1 Stone Road West, 5th floor NW, Guelph, ON N1G 4Y2, Canada. It is available in both French and English, you must specify which.

North American Maple Syrup Council, Inc.
RESEARCH FUND

Guidelines for Submitting Research Proposals

Research Proposals will be received and considered for funding by the North American Maple Syrup Council in accordance with the following guidelines:

1. Proposals must be received no later than July 1st to be considered for funding by the Directors of the North American Maple Syrup Council at their October Annual Meeting.
2. Proposals shall be complete and detailed in content. It is suggested that each research proposal include the following information:
   - Name, Type, Purpose and Intent of proposed research
   - Name and address of submitting entity, contact person, phone, fax numbers, email / website address.
   - Location where research will take place
   - Duration / Schedule / Phasing of research project
   - Anticipated benefit of proposed research to the maple industry
   - Listing of similar or duplicating research in progress or previously competed and why proposed research is warranted.
   - The amount of funding being requested with a detailed cost breakdown specific to the amount of funding being requested.
3. A condensed version (executive summary) of the research report must be provided as part of the proposal.
4. Results or progress report of funded research projects must be presented annually at the NAMSC annual meeting and submitted for publication to the Maple Syrup Digest upon completion.
5. Forty - (40) complete copies of the proposals shall be submitted to the NAMSC Research Fund Chairman Richard P. Norman at the address listed below.

Please note that these are guidelines and subject to the terms and conditions contained in the *General Agreement*, required to be completed prior to payment of any approved funding. A copy of the Agreement is available upon request.

For more information please contact:

Richard P. Norman, Chairman, 387 County Road, Woodstock, CT 06281-2112
Phone 860 974-1235, Email: r.norman@snet.net
Michael A. Girard, Treasurer, 352 Firetown Road, Simsbury, CT 06070-1238
Phone 860 658-5790, Email: mgirard@simscroft.com

The NAMSC-Research Fund is a non-profit, volunteer managed committee of the North American Maple Syrup Council, Inc. (6-04)

NEW HAMPSHIRE UPDATE

By Barbara Lassonde

At the New Hampshire Maple Producers Association annual meeting in January, the Carlisle Award for excellence in maple syrup production was presented to fifteen-year-old Ben Fisk of Ben's Sugar Shack in Temple for his Grade A Medium Amber syrup. Alan Dustin of Alstead took second place and Lucien Belleau of Dummer placed third.

Ben Fisk began sugaring when he was five years old, and expanded his operation every year until he had 1,200 taps last year and plans for 2,000 this year. Last summer he and his father expanded the sugar house for his new 4x12 evaporator.

Although he does most of the work involved in sugaring, Ben receives some help from his father and grandparents, as well as two friends he hires during the busiest times. Because he is too young to drive, his grandfather drives him to collect sap from the three orchards he taps.

In addition to making syrup, Ben also makes maple cream, candy and cotton candy, and sells his products from his sugar house evenings and weekends. They are also sold at two area stores and through his website: www.benssugarshack.com.

Board members for the Association elected for the upcoming year were: Bill Eva, President; Peter Thomson, Vice President; Betty Messer, Secretary; Howard Pearl, Treasurer; and Directors: Dave Fuller, Hank Peterson, Bruce Borden, Paul Messer, Dave Scanlan and Alan Dustin.

Regional educational sessions were held in four locations around the state in February, and all were well attended. The programs this year were geared to the small producer.

New Hampshire's Governor Craig Benson officially started off the state's maple season by tapping a tree at Sweet Maples Sugar House in Newbury. Jeff, Doug and Pieter Sweet hosted the event which drew about seventy maple producers and members of the media.

The first runs of sap in southern New Hampshire began on February 27, which was more normal than last year's late start of March 15. And unlike last year's poor production, this year's harvest was a record-breaker for many sugar makers. Not only did most southern producers make large amounts of syrup, much of it was light amber. For some, half of their crop was light amber. Grade quantities varied from one sugar house to the next and from North to South, but everyone interviewed remarked about the outstanding flavor the syrup had this year.

Although the sugar content of the sap was not unusually high, quantities were, especially in the southern part of the state. With the exception of a warm spell at the beginning of the season, weather conditions were nearly ideal. Many sugar makers recorded one stretch when the sap ran continually for 72 hours, keeping collection tanks overflowing and evaporators fired up.

New Hampshire Maple Weekend received good media coverage and drew tens of thousands to sugar houses around the state. Northern producers were boiling that weekend, but those in the southern part of the state where the season was nearing an end, had to hold sap for the weekend or boil water.

Overall, this year's exceptional harvest was an encouraging turnaround from last year's poor season and those who were discouraged last year now have a renewed enthusiasm.

NEW YORK NEWS

By Marion Wells

Another maple season has come to an end, with some surprises. Most producers agree that it was a much better year than 2003. The season started a little late, early March in most areas, although the southern tier and western New York got started in late February. Many areas report 70-80% of a normal crop. Most producers on vacuum did well, while gravity systems did not yield as much sap. Great quality seemed to be the rule this year, many producers having no trouble making lots of light and medium amber. The cold nights during the early part of the season kept the sap in excellent shape which led to good light and medium grades. You could see the grade drop as soon as the warm nights arrived.

Maple weekend by all reports was very successful across the state with more producers participating than last year. Upper Hudson Association kicked off the weekend with a tree tapping at Rathbun's sugar house. State maple queen Jessica Goblet, Ag. and markets Commissioner Nathan Rudgers and State Senator Betty Little and other area dignitaries were on hand. A delicious pancake meal was enjoyed by all. Michael Parker reported that attendance both Saturday and Sunday at their West Chazy sugar house was very good. The visitors loved the horse drawn wagon rides to the sugar bush. Shaver-Hill farm in Delaware County featured a maple open house weekend with a tree tapping demonstration among numerous other activities. Maple Queen Jessica Goblet and Commissioner Rudgers were in attendance at Shaver-Hill and at VVS in Verona to help inaugurate the maple weekend there.

The American Maple Museum in Croghan, New York opened its doors for the 2004 season on May 15th. Starting with a pancake breakfast, then the state maple queen contest, followed by the Hall of Fame ceremony, it was a memorable day. This years inductees are Larry Myott, retired Vermont maple specialist, and Steve Selby of Algiers Evaporator Company. Both gentlemen have had distinguished careers in the maple world. Why not plan to visit the American Maple Museum this summer of early fall? It's the very best maple museum anywhere, and its sure to please you with its numerous displays of the tools and equipment used from colonial times to the present. Next years opening day at the museum will be May 21, 2005. Mark your calendar now so you won't miss this great annual event.

We'll be looking forward to seeing all of you at the NAMSC-IMSI and NY Tour meetings this fall at the Roaring Brook Resort in Lake George, NY. The dates are October 17-20, 2004.

For more information contact:

Mike Hill
1 Robin Drive,
Warrensburg, NY 12885
Email: mhill@johnsburg.k12.ny.us
Phone: (518) 623-9783

IMPROVING EVAPORATOR EFFICIENCY

by Jim Fruth

I have two forced air, wood fired evaporators and both have usually failed to boil in the front pan or within four inches of either side. I solved that spending under $50. Now the front pans boil and boiling occurs all the way to the sides, even above the side rail. What I did was relatively simple and nearly anyone should be able to accomplish it.

From the local hardware store, I purchased a roll of 14" aluminum flashing and some stainless steel fasteners. I also bought several feet of ceramic blanket from a maple equipment dealer, plus I used a little fiberglass insulation. My idea was to insulate the front and sides of the evaporator pans.

The equipment I used to fabricate it was two saw horses with 2 x 4 rails, two four-foot lengths of 1" x 1" angle iron, two 6" 'C' clamps, a kitchen shears to cut the flashing, a rubber head hammer, a ball-peen hammer and an electric drill.

I cut the flashing to required lengths so as to make panels that would fit between float boxes, fittings, etc. Then I measured and marked each length for three bends. The bottom bend would be 2" so 1" of each panel could be installed under the edge of the pan and the other inch accommodates the ceramic blanket. Along the top edge, two bends; one was bent 1" in (parallel to the bottom bend) and 1" bent up so it would fit flat against the side of the pan.

I could have taken the bending part of the project to a sheet-metal shop but, since I'm handy, I did it myself: One length of angle iron was placed along the length of the saw horse with its angle down and the other atop that with its angle up. The cut piece of flashing was sandwiched between with its marked line up and the 'C' clamps held it all to the 2x4 rail of one saw horse (The second saw horse was used as a prop to help hold the flashing in place).

To bend metal by hammering, it must be bent only a little at a time or it will buckle and not lay flat. I used the rubber head hammer first, tap, tap, tapping back and forth, back and forth, until the material was almost bent at a 90° angle. Then I used the ball-peen hammer to finish each bend to a sharp angle.

I made panels for around the float boxes too. These were a bit trickier because three sets of bends were required to make them in one piece. This bending required the bends to be made at the ends of the angle irons and only one 'C' clamp was used to hold it all together.

The bent panels allowed for ten inches of insulation by the length of each panel. I used 6" widths of ceramic blanket along the bottom of each panel (where the boiling occurs) and fiberglass for the top 4". The ceramic blanket and fiberglass are held in place with silicone caulking.

As mentioned above, 1" of the 2" bend is to be slid under the bottom edge of the pan to hold the panel in place. I held the top of the panels to the pan by drilling a 1/4" hole through the top lip of the panel through the sides of the evaporator pans, holding the panels in place with 1/4" stainless steel bolts, nuts and flatwasher. The holes drilled into the sides of the pans are well above where any sap/syrup ever gets so there is no danger of leaks. When drilling stainless steel, care must be taken to drill slowly because running the drill too fast will quickly dull the drill bit.

There may be other ways to insulate the sides of the pans. I did it this way because it was cheap, I could accomplish it myself and and I have panels that are relatively durable that I can expect to last for many years. My reward? My evaporators now make maple syrup 30% faster than they did before.

WEATHER FORECASTS FOR MAPLE PRODUCERS

Keith L. Eggleston
Northeast Regional Climate Center
Cornell University
Ithaca, NY

Weather conditions are the single most important factor affecting sap production in the sugar maple. Weather forecasts, therefore, can be a very valuable tool for maple syrup producers. The most popular weather forecasts are those that are disseminated to the public through radio, television and newspapers. These short-range forecasts predict temperature and precipitation patterns over the next few days. They have increased in accuracy over the past few years, due in large part to improved computer models and advances in radar and satellite technology. These forecasts have the greatest accuracy for the next 24 to 48 hours, with decreased accuracy beyond three to five days.

The National Weather Service and commercial weather forecasters (example The Weather Channel, AccuWeather, local TV stations) all use the same information and computer models. The human factor interpreting the information can produce different forecasts, but there is no general reason why one would be better than another. The National Weather Service has eleven forecast offices within the maple producing areas of the Northeast. These offices produce forecasts for each county within their area of responsibility and issue severe weather watches and warnings, when necessary.

A less well known, but potentially useful category of forecasts, is the medium-range forecasts distributed by the National Weather Service. They are available on the Climate Prediction Center's web site: http://www.cpc.ncep.noaa.gov/products/predictions/. These outlooks are less precise, as they indicate only general trends, rather than specific projections of daily temperature extremes and precipitation amounts. These forecasts are routinely created for 6-10 days and also 8-14 days into the future. Generally their accuracy is better than 50%. They can, therefore, be useful as a tool for planning operations for the next week or two. An accurate medium-range forecast can help predict the advent of the sap flow season with a lead-time of one to two weeks.

Medium-range forecasts are based on understanding atmospheric circulation, improved statistical techniques, and increasingly sophisticated computer models. The finishing touches are still applied by an experienced human forecaster. Some of the tools used in creating these forecasts have such exotic names as "neural networks", "teleconnections", and "ensemble spaghetti diagrams". Some of these tools are purely statistical in nature. Others are based on knowledge of how similar weather systems have evolved in the past. The most relied-upon tools, however, are computer models of the expected changes of weather patterns beginning with the present situation and prognosticating out through the next two weeks. These models are based on measurements of existing weather conditions at the surface (i.e. locations of high and low pressure areas, orientation of warm and cold fronts, and temperature patterns) and in the upper atmosphere (i.e. location of the jet stream). Based on known physical interactions that occur within the atmosphere, the models are able to forecast future movement and evolution of weather systems and the expected temperature and precipitation patterns.

The final type of forecast product is the long-range forecast. There are two types of long-range forecasts, monthly and seasonal. Monthly forecasts are usually done two and a half weeks ahead of the start of each month. Seasonal forecasts cover 3-month periods extending out for one year. At this time, there are relatively few climate phenomena that can significantly influence the accuracy of long-range forecasts; the El Niño and La Niña conditions are among the best known. Most of the time, long-range forecasts will not be useful management tools for maple producers.

Medium-range and long-range temperature and precipitation forecasts take the form of categorical forecast maps. Categorical forecasts begin with each region having an equal chance of "above normal", "near normal" and "below normal" temperatures or precipitation amounts for the period in question. When considering a large number of years, each of these three categories occurs, on the average, a third of the time. These categories are based on observed temperatures and precipitation amounts over the last three decades-currently 1971 through 2000.

Using the first week of March in Lake Placid as an example, a third of the years between 1971 and 2000 had an average temperature for the week of less than 20 degrees Fahrenheit, a third were between 20 and 23.8 degrees, and a third above 23.8 degrees. Therefore, 20.0 degrees represents the cutoff between below normal and near normal temperatures for the week, while 23.8 degrees is the cutoff between near normal and above normal temperatures. Based on this, a March 1-7 period with an average temperature of 25 degrees would be classified as "above normal". Cutoffs for these three categories for precipitation are computed in much the same manner.

Categorical "equal chance" (EC) forecasts are then adjusted based upon information about conditions that drive weather events. If it seems likely that conditions in a region will be above normal, then the above normal category is moved higher than 33.3% and the below normal category moved to a lower probability to maintain a total of 100%. Portrayals by the media of medium and long-range forecasts typically only describe the highest probability outcome and don't tell you what the probability estimate is. Thus it is possible to have a forecast of "above normal" when the probability of that occurring is less than 50%. Following is a sample of the 6-10 day temperature forecast map issued on April 8th,, which covers the period April 14-18 where the probabilities are shown. The highest probability on this map is 50%. "Normal" usually means that there is an equal chance for each of the three categories occurring. Climate Prediction Center long-range forecast maps use "EC" rather than "normal" to reflect the equal chance condition.

The Northeast Regional Climate Center (NRCC) is one of the country's six regional climate centers. Established in 1983, the NRCC is located in the Department of Earth and Atmospheric Sciences at Cornell University. It serves the 12-state region extending from Maine to Maryland and West Virginia. The mission of the NRCC is to facilitate the collection, dissemination and use of climate data; assess regional climate conditions and their impacts; and conduct applied research in support of these goals. You can visit the NRCC web page at: http://www.nrcc.cornell.edu.

SHELF LIFE EXTENSION OF MAPLE CREAM

Olga I. Padilla-Zakour,
Randy W. Worobo, Kawaljit Tandon, John Churey,
Department of Food Science & Technology, Cornell University
Chuck Winship and Lyle Merle, Maple Syrup Farmers

Introduction

Maple cream, a value-added product, is manufactured from pure maple syrup by additional concentration by evaporation, quick cooling, stirring and then packaging at room temperature. Nothing is added to the pure maple syrup to make the maple cream product although the industry name implies there is cream in it. The finished product is light colored, smooth creamy textured, that is used on toast, bagels, muffins, pancakes, etc. From the marketing point of view, it is an all natural product comprised mainly of sugars but it also has other important nutrients such as amino acids, proteins, organic acids, minerals (calcium and potassium being the most prevalent) and trace levels of vitamins (Koelling and Heiligmann, 1996).

During production, the maple syrup is heated to high temperatures (234 to 236°F), which eliminates all pathogenic microorganisms, but the subsequent steps involved rapid cooling to produce the fine crystals and filling at room temperature, all in an open environment where the maple cream is re-contaminated. At the high levels of sugar concentration of the cream, the pathogens can not grow but the spoilage microorganisms, reportedly molds and yeast, can slowly grow and spoil the product. That is why the cream is sold under refrigeration, limiting the marketing potential for the product.

Pure maple cream has a shelf life of less than one month if stored at room temperature. The maple cream may mold and physically separate into its maple syrup component during this period. The current product requires refrigeration to achieve an acceptable shelf life of 6 months. This requirement significantly reduces marketability, distribution and availability of the product to the consumer. The storage and handling requirements also increase the final cost to the consumer. As a result, production, consumption and farmer profit is limited.

Project Goals

Our goal was to develop a process to attain 6 months shelf life at room temperature. One major limitation is that pure maple cream requires packaging at room temperature and therefore can be contaminated with microorganisms present in the environment. To limit the molding problem that occurs on the surface, we evaluated packaging under UV exposure, adding calcium carbonate as a processing aid and flushing the headspace with nitrogen, carbon dioxide and steam. In addition, we studied the standardization of the maple syrup to optimal sugar composition prior to cream preparation in order to minimize the physical separation during the product shelf-life. We evaluated the various proposed processes utilizing farmer capable equipment and applying accelerated shelf life testing techniques to prove the proposed preservation concepts.

METHODOLOGY

Mold spoilage: To address the mold problem, various techniques were investigated that included:

1. Addition of a food preservative (potassium sorbate) at low concentrations;
2. Ultraviolet light decontamination of product surface & closure before closing- 5 min exposure;
3. Flame sterilization of product surface before closing using a bunsen burner;
4. Steaming of product headspace to create an anaerobic environment at closing using a cappuccino machine;
5. Carbon dioxide headspace flushing by applying gas directly from a cylinder at low pressure;
6. Nitrogen gas headspace flushing by gas directly from the cylinder at low pressure and;
7. Addition of 400 ppm sodium bicarbonate to the cream to generate carbon dioxide gas on the headspace of the closed container.

The incidence of mold spoilage in maple cream is relatively low and to more accurately assess the effectiveness of the various treatments, mold from spoiled maple cream samples was collected, cultured and used as an inoculum to the various maple creams treated with the various treatments. A consistent inoculum of vegetative mold was added to each of the treatments. As a control, maple cream prepared under the same conditions was inoculated with the same level of vegetative mold spores. This procedure assured that all the samples were contaminated with mold to enable the evaluation of the various treatments.

A total of ten 8-ounce containers filled with freshly produced maple cream were used for each treatment. The mold was added to the jar and mixed with sterile mixing tools and then the various treatments were applied. For the potassium sorbate treatment, the mold was added after the addition of the preservative. An initial level of the mold spores was determined by plating onto acidified Potato Dextrose Agar (pH 3.5). The samples were placed at 86°F (30°C) and visually observed for mold growth on the surface without opening to avoid secondary contamination or destroying the treatment conditions. The incubation temperature is an accelerated shelf life study that results in a double of the actual holding time at room temperature 70°F (20°C). The samples were examined after 1 and 2 months of holding at 86°F (30°C). Observation of mold growth on the surface indicated a "positive" result and the number of positive mold samples for each treatment was recorded.

In a smaller trial, we also added a small amount of salt to the maple cream samples to determine whether this would produce a more stable product over time. Salt concentrations of 0.1, 0.25, 0.5% were added to the samples.

The water activity of all the samples was measured to determine if a low number was achieved. This value indicates the amount of free water (water not bound to compounds) that is available for microbial growth. The water activity of a food is not the same thing as its moisture content. Although moist foods are likely to have greater water activity than are dry foods, this is not always so; in fact a variety of foods may have exactly the same moisture content and yet have quite different water activities. A reduced water activity will result in better shelf-life as the mold will not grow or grow very slowly. The water activity scale extends from 0 (total dryness) to 1.0 (pure water) but most foods have a water activity level in the range of 0.2 for very dry foods to 0.99 for moist fresh foods. For a food to have a useful shelf life without relying on refrigerated storage or preservatives, it is necessary to control either its acidity level (pH) or the level of water activity (aw) or a suitable combination of the two. This can effectively increase the product's stability and make it possible to predict its shelf life under known ambient storage conditions. Food can be made safe to store by lowering the water activity to below 0.85, which will not allow pathogens to grow. To render a product shelf stable at room temperature, the water activity should be 0.6 or lower, although most molds cease to grow or slow down at water activity levels below 0.8 (Worobo and Padilla-Zakour, 1999). Maple cream has a water activity of 0.8 to 0.85 and therefore it is a safe product but allows the growth of mold.

Physical separation problem: To address the physical separation the amount of invert sugar present in the maple syrup was studied. The concept was based on the honey cream, which is stable without refrigeration (Morse, 1983). To convert the sugar in the maple syrup (sucrose) to invert sugars (a mixture of glucose and fructose) an enzyme called invertase was used. This enzyme is commercially available for use by the confectionery and baking industry (DSM Food Specialties, USA). This is considered a processing aid and does not need to be declared on the product label. We added 0.1 to 0.25% enzyme solution to a batch of maple syrup, mixed well and then maintained the syrup at 120 °F (50°C) for 24-48 hrs. in a regular oven. The degree of inversion was monitored using the simple and inexpensive urine sugar test (Clinitest tablets by Bayer).

Small percentages of the inverted syrup solution were added to the maple syrup to be used for boiling to determine the optimum level. The inverted syrup was then boiled to concentrate to approximately 85°Brix (235 to 240°F). The syrup was then rapidly cooled to temperatures below 50°F. For creaming purpose, a potter's wheel type stirring machine was used. Stirring was stopped when the cream lost its shiny appearance and developed a dull flat look. The cream was then transferred to 6 oz. glass jars and stored. Samples with added inverted syrup were compared to the standard cream prepared by heating the syrup to a temperature of 22 to 24 °F above the boiling point of water.

Results

The results are presented in two sections to address the spoilage (mold) problem first followed by the physical separation into liquid and solid layers in the second section.

Mold problem

Initial studies with all the treatments clearly indicated that only potassium sorbate and carbon dioxide provided promising treatments to control the growth of mold. These two treatments were further investigated to determine effective control levels of potassium sorbate and longer carbon dioxide headspace flushing. Three different levels of potassium sorbate commonly used on food products were used (250, 500 and 1000 ppm) with freshly prepared maple cream and subsequently inoculated with the same maple cream mold spoilage organism. The samples were then incubated at 86°F (30°C) for 2 months which is equivalent to 4 months at room temperature. The results of this study further indicated that carbon dioxide headspace flushing provided no protection against mold spoilage resulting in 100% spoilage of all samples. In case of samples with potassium sorbate added, no spoilage was observed at the levels used (Table 1). The maple cream samples containing the various levels of potassium sorbate were evaluated for their organoleptic qualities. No differences were noted in 250 or 500 ppm but an off-flavor was detected with the 1000 ppm potassium sorbate maple cream samples.

Table 1. Microbiological results from maple cream samples inoculated with mold.

Treatment	Number of samples with surface mold
Control	10/10
CO_2 headspace flushing	10/10
250 ppm potassium sorbate	0/10
500 ppm potassium sorbate	0/10
1000 ppm potassium sorbate	0/10

In summary, potassium sorbate even at low levels of 250 ppm was identified as a potential treatment to provide protection for up to 4 months against mold spoilage associated with maple cream product. To assure a 6-month shelf-life at room temperature, a level of 500 ppm is recommended (further testing confirmed the need for 500 ppm).

Physical Separation

Maple cream samples were produced by adding different concentrations of inverted maple syrup to each batch. The syrup was concentrated to about 85°Brix before the cooling step. Summary of preliminary trials is shown in Table 2.

Table 2. Evaluation of maple cream samples produced with varying levels of inverted maple syrup and stored at room temperature.

% Inverted syrup	Observations
0 (control)	Very grainy, large crystals
10	Good consistency, good sweetness and little grain
20	A bit grainier, some crystals
50	Good consistency, very sweet (too sweet)

From the first tests (Table 2), it was clear that an invert level lower than 30% was necessary to maintain the typical maple cream flavor. A second round of tests was run to narrow down the concentration of invert syrup required.

Table 3. Evaluation of maple cream samples produced with varying levels of inverted maple syrup and stored at room temperature.

% Inverted syrup	Observations
0 (control)	Grainy with crystals
15	Little separation, grainy
20	Little separation, grainy
25	Grainy, significant separation
30	Grainy, significant separation

From these trials (Table 3), it was concluded that the procedure to make the cream had to be carefully controlled, as the texture was not consistent from one test to another. After further practicing and standardization another test was run.

Table 4. Evaluation of maple cream samples produced with varying levels of inverted maple syrup and stored at room temperature.

% Inverted syrup	Observations
0 (control)	Grainy, separation
5	No separation, good consistency
10	No separation, good consistency
15	Separation
20	Separation
25	Separation
30	Separation

From the results shown in Table 4, we concluded that a 5-10% level of inverted syrup was best. We proceeded to perform a shelf-life study with 10% inverted syrup and potassium sorbate added to assess the long-term stability of the maple creams.

Table 5. Shelf-life study of maple cream samples produced with 10% inverted syrup and 250 ppm potassium sorbate, evaluated at 2 and 6 months.

Treatment	Storage Temperature	°Brix	Water Activity (a_w)	Observed Surface Mold	Separation % vol/vol Syrup/Cream
Control 1	Room temp.	84.6	0.81-0.82	Mold (2 mo.) Mold (6 mo.)	20% (2 mo.) 23% (6 Mo.)
Control 2	Room temp.	84.6	0.79-0.81	No mold (2 mo.) No mold (6 mo.)	21% (2 mo.) 25% (6 mo.)
Control 3	Room temp.	85.9	0.81-0.82	Mold (2 mo.) Mold (6 mo.)	20.5% (2 mo.) 23% (2 mo.)
Control 4	Room temp.	83.8	0.81-0.82	No mold (2 mo.) No mold (6 mo.)	22% (2 mo.) 25.5% (6 mo.)
Invert 1	Room temp.	83.5	0.77-0.79	No mold (2 mo.) No mold (6 mo.)	5% (2 mo.) 12% (6 mo.)
Invert 2	Room temp.	84.3	0.78-0.79	No mold (2 mo.) Mold (6 mo.)	5% (2 mo.) 11% (6 mo.)
Invert 3	Room temp.	85.0	0.73-0.78	Mold (2 mo.) Mold (6 mo.)	6% (2 mo.) 12% (6 mo.)
Invert 4	Room temp.	82.4	0.75-0.78	Mold (2 mo.) Mold (6 mo.)	5.5% (2 mo.) 11% (6 mo.)
Control 1	86°F (30°C)	86.4	0.80-0.82	No mold (2 mo.) No mold (6 mo.)	21% (2 mo.) 23% (6 mo.)
Control 2	86°F (30°C)	84.1	0.78-.82	No mold (2 mo.) No mold (6 mo.)	20.5% (2 mo.) 22% (6 mo.)
Invert 1	86°F (30°C)	83.8	0.75-0.78	No mold (2 mo.) No mold (6 mo.)	8% (2 mo.) 12% (6 mo.)
Invert 2	86°F (30°C)	83.1	0.73-0.78	No mold (2 mo.) No mold (6 mo.)	9% (2 mo.) 13% (6 mo.)

The results in Table 5 show that the samples with invert syrup had slightly lower water activities but was not sufficient to impede the growth of mold, even with the addition of potassium sorbate at 250 ppm. Select molds and yeast are capable of growing at very low water activities (aw = 0.60-0.70) and are called osmotolerant. The mold isolated from maple cream falls under this category. In all cases, the control samples were of hard texture and very low spreadability due to the additional concentration to achieve 85°Brix. The samples with 10% inverted syrup had a creamy texture and were easily spreadable. The amount of separation was significantly reduced by the use of invert syrup as after 6 months, the invert samples had 12% or less of separation compared to 25% for the control samples.

The use of salt was investigated to evaluate if additional stability could be achieved by adding very small amounts to the cream. Results are presented in

Table 6. Concentrations above 0.1% were not considered acceptable due to salty taste. The use of salt did not seem to offer advantages but a more complete study was performed to confirm the results. The samples prepared with inverted syrup were very stable as no mold was observed and minimal separation occurred.

Table 6. Evaluation of maple cream samples produced with low levels of inverted maple syrup and added salt and stored at room temperature for 6 months

% Inverted Syrup	Initial Observations	Separation and Mold after 6 months
5% (3 replicates)	Creamy texture, little separation 84.4°Brix, 0.68 Aw	Minimal separation - no mold
10% (3 replicates)	No separation, creamy texture 81.8°Brix, 0.76 Aw	No separation - no mold
10% + 0.1% salt (3 replicates)	Creamy, no separation, hint of salty taste 83°Brix, 0.72 Aw	No separation - no mold
10% + 0.25% salt (3 replicates)	Less creamy, no separation, a bit salty 83°Brix, 0.70 Aw	No separation - no mold

Table 7 shows the final shelf-life study conducted using 5 and 10% invert syrup for cream preparation. The study also evaluated the use of salt and potassium sorbate.

Table 7. Evaluation of maple cream samples produced with low levels of inverted syrup, salt and potassium sorbate and stored at room temperature for 6 months

Treatment (2 replicates)	Separation and Mold after 6 months	Texture °Brix, A_w	Taste/other
5% inverted syrup	No separation No mold	Spreadable 80.4°Brix, 0.76 Aw	Typical
5% inv + 0.1% salt	No separation No mold	Spreadable 80.2°Brix, 0.76 Aw	Hint of Salt Acceptable
5% inv + 250 ppm sorbate	No separation No mold	Spreadable 80.0°Brix, 0.72 Aw	Typical
5% inv + 0.1% salt + 250 ppm sorbate	No separation No mold	Spreadable 80.0°Brix, 0.72 Aw	Hint of Salt Acceptable
10% inverted syrup	No separation No mold	Creamy & spreadable 80.4°Brix, 0.74 Aw	Typical
10% inv + 0.1% salt	No separation No mold	Little grainy 85.2°Brix, 0.54 Aw	Hint of Salt Acceptable
10% inv + 250 ppm sorbat	No separation No mold	Little grainy 82.7°Brix, 0.62 Aw	Typical Typical
10% inv + 0.1% salt	No separation No mold	Spreadable 82.3°Brix, 0.71 Aw	Hint of Salt Acceptable

From all the shelf-life studies, we concluded that the potassium sorbate at 250 ppm might not be 100% effective as some surface mold was observed sporadically (very small amounts) and the 500 ppm is therefore recommended. The separation problem was minimized by the use of 10% inverted syrup given an acceptable product with good consistency and very little or no separation. After 6 months, the samples remained stable and in good condition. Careful control of the process will be necessary as in some cases the maple cream samples were a bit grainy, most likely due to over concentration of the syrup.

It is also recommended that the maple cream jars be labeled "Best if used by . . ." dated 6 months after production and "Refrigerate after opening" to allow the consumer to keep the product for longer periods of time.

Estimated Revenue Increase to Maple Syrup Farmers

It is estimated a room temperature shelf life of six months would benefit the Northeast Maple Syrup Industry by a $1.6 million yearly increase in revenue. (Note: Total Northeast USA Maple Syrup revenue for the year 2000 is $28.2 million. This represents approximately 20% of North American production.). The estimate was calculated with the following assumptions: Retail value of maple syrup $28 per gallon, retail value of maple cream $60 per equivalent gallon (based on syrup), maple syrup producers normally dedicate 5-10% of their syrup to maple cream manufacture. If we assume that currently 5% is dedicated to maple cream then $28.2 million x 0.05 = $1.4 million as maple syrup which is equivalent to $3 million as maple cream, i.e., a net increase of $1.6 million. If by developing good manufacturing practices for the production of shelf-stable maple cream we can increase production and market to 10% (conservative value) then an extra $1.6 million revenue will go to the producers.

Economic Findings

The addition of potassium sorbate will increase the cost of the product less than $0.01 per pound of finished product and does not require any specialized equipment. The use of an enzyme to increase the invert sugar content cost is approximately $0.05 per pound of finished product and utilizes equipment already on a typical maple syrup farm, i.e.: kitchen oven or crock pot. Total cost is expected to be less than $0.10 per pound of finished product and will not require any equipment not already available on a typical maple syrup farm.

Maple Cream Extended Shelf Life Manufacturing Process

The following maple cream manufacturing process is copied from the "North American Maple Syrup Producers Manual", The Ohio State University Extension Bulletin 856, copyright 1996, page 119 with additions to the standard process that is a result of this work. Changes made to the standard process to produce the extended shelf life maple cream are in Italics.

"Maple spread (cream), a fondant-type confection, is prepared by elevating the boiling point of maple syrup to a prescribed level, then rapidly cooling the cooked syrup followed by stirring. This procedure results in the formation of very small crystals, which together have a "peanut butter consistency". Maple spread is a delectable topping for toast, muffins or other similar products. For best results, the syrup from which maple spread is prepared should be U.S. grade A Medium Amber or lighter. However, other grades of syrup can be used if they contain less than 4 percent invert sugar.

. . . Syrup that contains from 0.5 to 2 percent invert sugar will make a fine-textured spread that feels smooth to the tongue. Syrup with from 2 to 4 percent of invert sugar can be made into spread by heating it to 25 degrees F above the boiling point of water (instead of the usual 22 to 24 degrees F). Syrup with more than 4 percent of invert sugar is not suitable for making spread. . . .

However, to prevent separation of maple cream into maple syrup during storage add a small amount of inverted syrup to the syrup which is to be converted to maple cream. This inverted syrup will be made by using an enzyme. The invert syrup is made by adding 0.1% to 0.25% by volume of the enzyme invertase to the pure maple syrup used for making maple cream. For a gallon of syrup to be converted to invert syrup add 1.5 teaspoons of invertase. Invertase is available commercially as it used by the confectionery and baking industry. This mixture is heated to 50 degrees C (120 degrees Fahrenheit) for 24 to 48 hours and then stored under refrigeration. The use of an oven or crock-pot is ideal for this purpose. This invert syrup solution is added to the maple syrup to be used for boiling to the higher temperatures needed to make maple cream.

The invert syrup should represent 10% of the final quantity of syrup to be boiled to the normal temperature required of maple cream. If one is using a one gallon batch size for cream production use 3.5 quarts of regular syrup and one pint of invert syrup mixed prior to boiling.

To prepare maple spread, syrup is heated to a temperature of 24 to 28 degrees F above the boiling point of water. It is important to consider the exact temperature at which water boils on the day maple spread is prepared since boiling temperature depends on atmospheric pressure. As soon as the boiling syrup reaches the desired temperature, it is removed from the heat and rapidly cooled. Rapid cooling is necessary to prevent premature crystallization. Quick cooling is facilitated by transferring the cooked syrup to large shallow pans. Refrigeration units or troughs with circulating cold water in which the pans are placed can be used. For best results, the syrup should be cooled to 50 degrees F or below. It is considered sufficiently cooled when the surface of the cooked syrup is firm to the touch.

Potassium sorbate is added after the boiling and cooling stages. Potassium sorbate is available at most stores that supply materials for wine making. Add potassium sorbate to the concentrated cooled product at the rate of 500 parts per million based on volume. If the cooled product is a result of one gallon of syrup prior to cooking add 0.3 teaspoons of potassium sorbate to the surface of the concentrated syrup.

Following cooling, the chilled syrup is stirred under room-temperature conditions. Stirring can be done by hand or by mechanical stirring machines. Several different types are available commercially or they can be fabricated. While being stirred, the cooled syrup first tends to become more fluid (less stiff), following which it begins to stiffen and show a tendency to "setup". At this point it loses its shiny appearance and develops a dull flat look. When this occurs, the crystallization process is considered complete and the spread can be transferred to appropriate containers. If stirring is stopped too soon, the final product may become somewhat grainy due to the formation of larger crystals. Likewise, if the cooking process did not reach the correct temperature, some separation (presence of liquid syrup on top of the crystallized cream) may occur while in storage.

To hasten the crystallization process, a small amount of "seed" (previously made spread) can be added to the glass-like chilled syrup just before stirring. The addition of 1 teaspoon of seed for each gallon of cooked syrup will provide small particles to serve as nuclei so crystals will form more rapidly. The entire stirring process may require from 1 to 2 hours, depending on the size of the batch, but the use of seed will often shorten the time by half.

Acknowledgements

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References

Koelling, M.R. and Heiligmann, R.B. (Ed.). 1996. North American Maple Syrup Producers Manual. The Ohio State University Extension Bulletin 856.

Morse, R.A. 1983. The Dyce process for making crystallized honey. Gleanings in Bee Culture. 111:441-442.

Worobo, R. and Padilla-Zakour, O. 1999 (winter). Water activity: another critical factor for safety of food products. Venture Vol. 1(4):5-6.

FDA REGISTRATION

Taken from *The Leaflet*, newsletter of the Mass Maple Association

There was much confusion last fall about the requirement for maple producers to register with the FDA, and possible exemptions that the producer may qualify for. The FDA has since specifically addressed the maple syrup industry and has ruled the following:

The FDA believes that the activities of maple syrup producers customarily consist of two types: gathering sap from sugar maple trees and concentrating the sap through the application of heat to make syrup. Gathering sap is "harvesting" as defined in the Interim Final Rule (21 CFR §1.227(b)(3)). However, concentrating sugar maple sap by heating is a form of manufacturing/processing.(21CFR §1.227(b)(6)).

Accordingly, a farm that both gathers and concentrates sugar maple sap is a "mixed-type" facility that ***is required to be registered****, unless all of the concentrated sap is consumed on the farm or another farm under the same ownership.*

(See question 2.15 at http://www.cfsan.fda.gov/~dms/ffregui3.html)

Also see: Question 1.4 at the same FDA website, which says:

Under 21 CFR §1.227(b)(2), a private residence is not a "facility" and thus, is not required to be registered. Importantly, such an establishment must meet customary expectations for a private home and does not otherwise include commercial facilities in which a person also happens to reside. A private residence includes the parcel of real property on which the residence is located. Accordingly, if the sugar in question is produced in a private residence or a detached building that would be considered part of the residence, such as a detached garage, the facility would not have to be registered. If, however, there is a separate sugar manufacturing/processing facility that is located on the private residence site, the establishment would be considered a mixed-type establishment and the manufacturing/processing facility would have to be registered, unless that facility qualified for another exemption (e.g., as a retail facility, 21 CFR 1.227(b)(11).).

PRESS RELEASE

On January 28th, the American Maple Museum, located on Main Street in Croghan, received designation as a Community Development Project using Zone Capital Credits for its handicapped accessibility project. Zone Capital Credits are a benefit of the state's Empire Zone program. These tax credits are allocated for the museum to offer to project contributors.

Dianna L. Mescher, Empire Zone Coordinator for Lewis County said, "This designation helps the American Maple Museum attract contributors for their project. Under this program, contributors will not only be able to deduct donations on their federal tax return; New York State taxpayers will also be able to claim 25% of their donation as a credit on their state income tax." The decision to allocate Zone Capital Credits to a project is made jointly by the local Zone Administrative Board (ZAB) and Charles A. Gargano, Commissioner of the NY Department of Economic Development. The ZAB voted to allocate the credits at their regular meeting on December 19, 2003, and Commissioner Gargano approved the project on January 28th, 2004. The Zone Capital Credits are available for not-for-profit community development activities tied to the Empire Zone.

For more information regarding the use of Zone Capital Credits or the handicapped accessibility project, contact Vernon Lyndaker, American Maple Museum president, at 315-346-6631, or by mail at 7898 Soft Maple Rd., Croghan, NY 13327, or by email at 7898lynd!@frontiernet.net.

PACKING GUIDELINES

Please be reminded that you should never cold pack syrup, regardless of what type of container it goes into. Minimum packing temperature is 180 in the container. This means syrup should be over 180 degrees in your bottling tank as it will cool once it goes into a cool containers. Because of the thickness of glass containers, they suck heat out of syrup more than metal tins or plastic. As a result, syrup should be a minimum of 185 degrees when packed into glass. Immediately after filling and capping, lay containers over on their side in order to have the hot syrup sterilize the inside of the caps. This also allows you to find any "leakers". The high temperatures are necessary to kill any stray mold or yeast spores that may be inside the containers or caps. Cold packing will eventually cause mold to form on the syrup or cause the syrup to ferment.

COMING EVENTS

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10th Bi-annual Conference & Field Tour
June 10-12, 2004
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For more information contact:
Dave Chapeskie, Agroforestry Specialist, Kempville
(613) 258-8302, Email: dave.chapeskie@omaf.gov.on.ca

VERMONT MAPLERAMA 2004
July 29, 30 & 31, 2004
Windham County, VT with headquarters at Mount Snow, VT
For more information contact:
UVM Extension (802) 888-4972

2004 PENNSYLVANIA MAPLE TOUR
October 1 and 2, 2004
Beach Lake, Pennsylvania
For more information contact:
Ron Hayden (570) 698-6906
haydenmaplewoodacres@earthlink.net

NAMSI/IMSI ANNUAL MEETING
October 17-20, 2004
Roaring Brook Ranch, Lake George, NY
For more information contact:
Mike Hill, 1 Robin Drive, Warrensburg, NY 12885
Phone: (518) 623-9783 Email: mhill@johnsburg.k12.ny.us

FEBRUARY 10-12, 2005

North American Farmers' Direct Marketing Conference and Trade Show, Boston Park Plaza Hotel, Boston, MA. In addition to educational sessions, outstanding speakers and a diverse trade show, the conference offers a three-day pre-conference bus tour, a day of workshops and a two-day post-conference bus tour.

For information, visit the Web site at www.nafdma.com, e-mail info@nafdma.com, or call (413) 529-0386. Registration begins Nov. 1 Pre-resigration deadline is Jan. 6.

CLASSIFIED

FOR SALE: Used oil burner Beckett CF 2300, 7-20 gph. very good condition. $1,095. Used stainless syrup pan, 5’ x 3’ Grimm-lightning. $750. ALSO: Carageenan for maple jelly, 1 1/2 lbs. or $19.95 or $25.00 shipped - recipe included. Baker’s Maple, P.O. Box 23, Bainbridge, NY 13733. *(607) 967-7229.*

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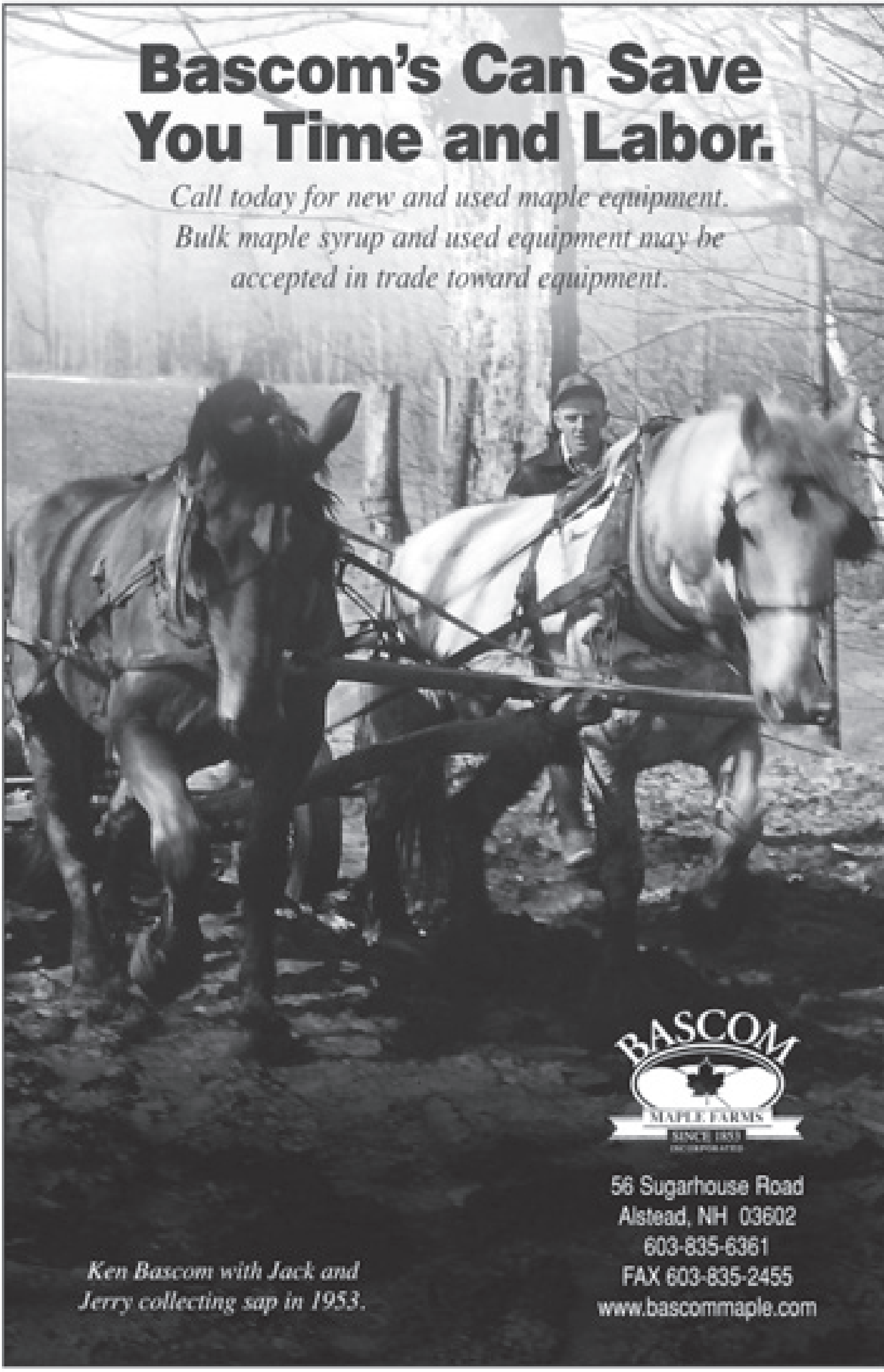

Ken Bascom with Jack and Jerry collecting sap in 1953.