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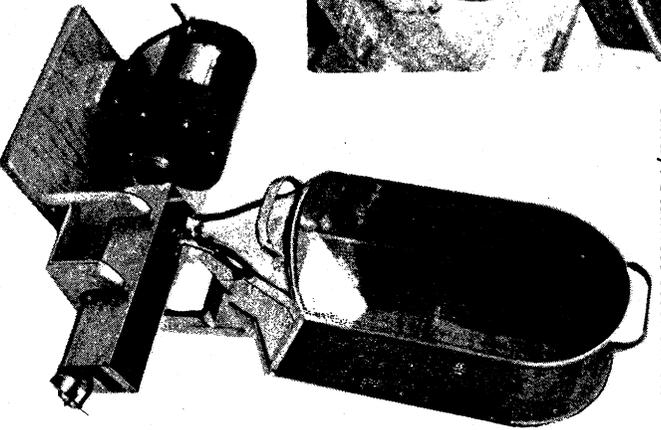
NATIONAL MAPLE SYRUP DIGEST NATIONAL





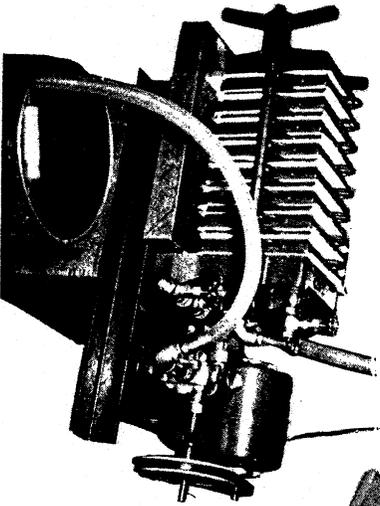
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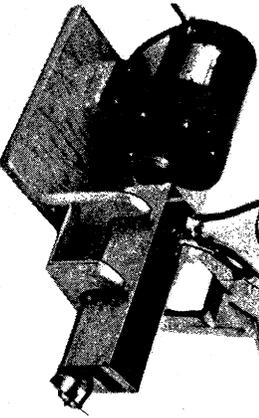
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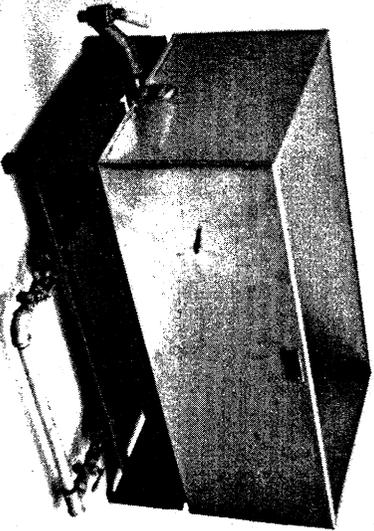
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Takes out all dirt and sugar sand. Electric motor operates a bronze gear pump to push hot syrup thru filter and lift it to any height. Capacity 2 gallons per minute.



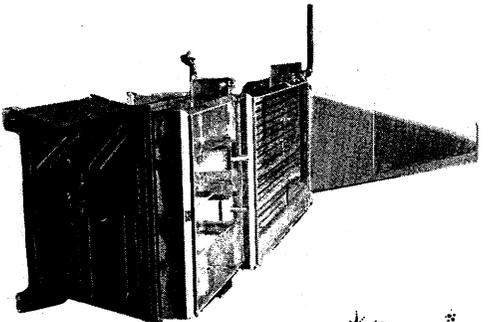
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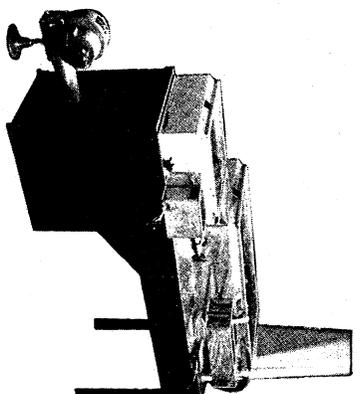


WOOD & OIL BURNING

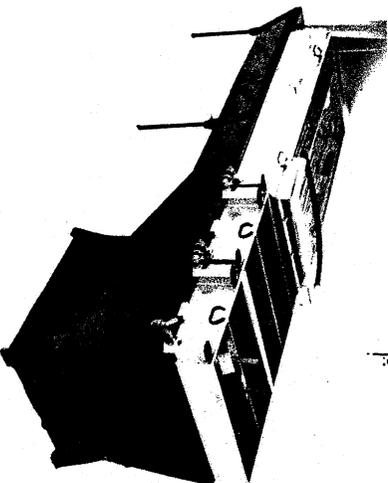
EVAPORATORS



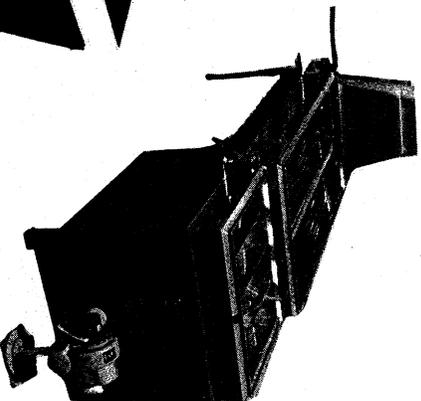
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2' x 6' OIL LIGHTNING



3' x 10' GRIMM EVAPORATOR



4' x 14' OIL LIGHTNING

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COVER PICTURE

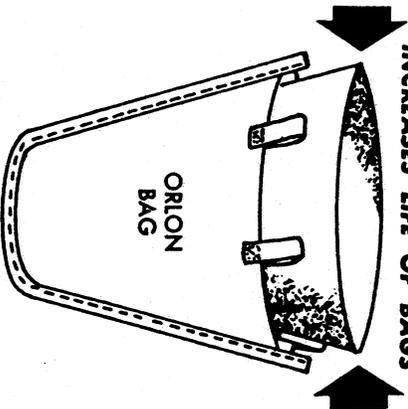
Horses, once the backbone of most sugaring operations, have given way to tractors and pipelines. Could this be why there's been such a decline in maple production?

Photo courtesy USDA, Philadelphia
Origin unknown

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MAPLE SYRUP PRODUCTION — 1973

This year's syrup crop was extremely erratic, varying from 5% or less in some areas of Ohio, Pennsylvania and western New York, to 125% in northern New England, New York, Michigan and Wisconsin. Canada had about the same variation from southern Ontario to Quebec.

The poor season was attributed mostly to unseasonably warm weather. Sweetness of sap was lower than in previous years, and a larger proportion of dark syrup was produced.

STATE	Syrup Made ¹		
	1971	1972	1973
	1,000 gallons		
New York	305	340	225
Maine	8	8	8
New Hampshire	38	51	48
Vermont	240	335	344
Massachusetts	25	28	19
Pennsylvania	94	96	48
Ohio	110	95	35
Michigan	86	83	66
Wisconsin	56	63	84

¹ Includes syrup later made into sugar. Does not include production on nonfarm lands in Somerset County, Maine.

U. S. Department of Agriculture
Statistical Reporting Service

N. Y. Dept. of Agriculture and Markets
Bureau of Statistics

ERRATA

On page 8 of the February, 1973 Digest, a sentence was omitted from the next to last paragraph in the article by Morrow and Staats. This paragraph should commence as follows: "Batch samples, taken before and after heating, were compared for color change. Of the 9 batches, 7 showed little if any visible color change. In one batch, the heated sirup . . ."

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**3RD ANNUAL ONTARIO MAPLE SYRUP TOUR
SATURDAY, July 28, 1973**

PLACE:

St. Joe's Island
(30 miles east of Sault Ste. Marie, Ontario)

REGISTRATION:

8:30 - 10:00 a.m.

Central Algoma Secondary School
½ mile West of Desbarrets
(corner Kensington Road and Highway 17)

Registration fee - \$2.00

Stop 1

(Tour by Autobus)
Gilbertson's Maple Bush and Pancake House

12 noon - 1:30 p.m.

LUNCH - Pancakes, Sausages and St. Joe's Island
Maple Syrup
Adults - \$1.50 Children - \$1.00

Stop 2

Stanley Down's Maple Bush

Stop 3

Harold Kent's Maple Bush
Light refreshments available

Stop 4

St. Joe's Island Museum

BANQUET AT CENTRAL ALGOMA
SECONDARY SCHOOL
Adults - \$3.00 Children - \$2.00

Entertainment provided by Fred Kent and the Northernraies.

ACCOMODATION IS THE RESPONSIBILITY OF EACH INDIVIDUAL

For further information or advance registration write:

W. A. Humphreys, Sec. - Treas., Ontario Maple Syrup Producers' Association
Box 175, Barrie, Ontario L4M 4T2 Tel. Elmvale (705)322-2233

(Cost of the complete day would be \$6.50 for adults).

N Y STATE MAPLE TOUR JULY 30 - 31

This year the New York State Maple Tour will take maple producers and other interested people to the hills and valleys of Chenango County in the southern tier region of the state. A committee has been working hard at making plans for the tour since late last winter. Chenango County is a large maple producing county and has a great deal to offer to maple producers throughout the east.

The tour will gather at the Rogers Conservation Education Center in Sherburne. Registration will take place from 11:30 a.m. until 1:30 p.m. For those producers that are interested and want to arrive early, a maple tubing demonstration will be set up at 10:30 a.m. There are picnic facilities at the Center for those bringing their lunch. The Education Center is quite unique and if you are interested in our environment here is an excellent opportunity to learn more about it through a visit to the main building or a walk along one of the nature trails.

During the afternoon there will be a stop at a woodlot to visit with state foresters about thinning and maintaining the sugar bush. Three local producers in the Sherburne area will also be visited. One producer purchases much of his sap and a local sap producer will be present to discuss his part of the operation.

The evening banquet will be held at the Canasawacta Country Club in Norwich where you will treat your taste buds to a wonderful buffet. Along with the usual tour business after the buffet, John Weeks, Director of the Rogers Center will tell you more about the

programs he and his staff have developed during the last few years.

On Tuesday morning the tour will pick up again and three producers will be visited in the southern end of the county. Plans call for the tour to conclude at Lloyd Stipple's at about 1:00 p.m. A light lunch will be available at the last stop for those who wish to eat before heading home.

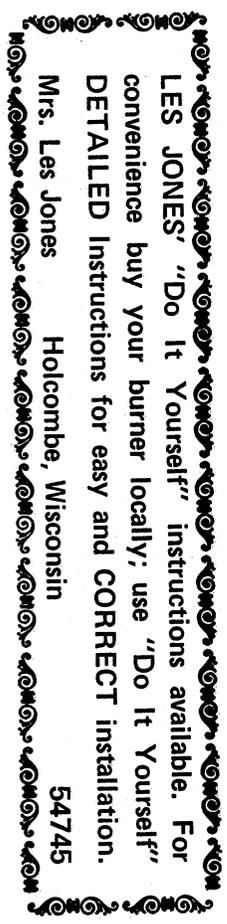
The producers in Chenango County have tried to put together a tour for producers, large or small. In addition the wife and children will enjoy the stop at the Rogers Center.

People requesting further information about the tour should contact William Worth, Cooperative Extension Agent, Farm, Home & 4-H Center, 99 North Broad St., Norwich, N.Y. 13815, telephone 607-334-9971.

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VERMONT MAPLERAMA '73

"In the heartland of Vermont"

Washington and Orange Counties — Thurs., Fri. — Aug. 16-17

It all begins at the Davis farm and sugarbush, Cabot, Vt. Woods thinning, pipelines and proper pipeline cleaning methods are demonstrated here. Registration is at 10 AM; lunch at noon.

Then for a detailed tour of Vermont's famous Cabot Creamery and Cheese Factory.

Last stop of the afternoon is the new VTC sugarhouse and maple operation at Randolph Center. Here at VTC (Vermont Technical College) will be the evening program including banquet, exhibits and entertainment. Dormitory for lodging, camping and motels available.

Friday morning breakfast at VTC, then off to Williamstown and the Flint farm for a new twist in vacuum pumping, among other things.

Then on to the Morse farm in E. Montpelier for a rounded out program of merchandizing and marketing from maple to Christmas trees. Demonstrations by N. E. Forest Ser., UVM, Vt. Dept. Forests & Parks and Vt. Dept. of Agric. & Mkts. along the way.

For advance Reservations and information contact John B. Smith, South Newbury, Vt., 05066, Tel. 802-866-3315. (For those who have time Fri. PM, a tour of the Barre Granite Quarries is near by).

NEED FANCY, A OR B BULK MAPLE SYRUP?

Plenty in northern Vt. Contact any of the following:

Vermont Dept. of Agric., E. Willard, Montpelier, 802-828-2419.
Franklin County Coop., C. Branon, Fairfield, 802-827-4440.
Orleans Co. Bulk Syrup, A. Patenaude, Derby Line, 802-895-4439.

PLEASE! SEND US YOUR CONTRIBUTION NOW!

VERMONT MAPLERAMA

AUG. 16-17, 1973

The Vermont Maplerama has been scheduled for Thursday, August 16, and Friday, August 17, 1973. Sponsored jointly by Washington and Orange Counties, the Maplerama will be conducted with the help of the Vermont Maple Sugar Makers Association and The Extension Service, University of Vermont. The program will begin at 10:00 a.m. on August 16 with a visit to the sugar bush of Robert and Barbara Davis in Cabot. Here demonstrations of sugar bush thinning and the washing of tubing will be seen. After lunch it will move to the Cabot Creamery; and to Williamstown and the sugar house of Roy Flint. (Tubing with vacuum pumps.) An evening dinner, exhibits, and program will take place at Vermont Technical College in Randolph Center.

On August 17 a visit will be made to Harry Morse's Sugar Shack on the County Road north of Montpelier. In the afternoon visits will be possible to the Rock of Ages granite quarries in Barre, as well as optional visits to other sugar places.

The Maplerama Committee consists of Rudolph (Shorty) Danforth of South Royalton, Chairman; Mrs. Barbara Davis of Cabot, Vice Chairman; Mrs. Mary Flint of Williamstown, Secretary; John Smith of South Newbury, Treasurer; and Myron Smith of Randolph, Asst. Treasurer. Reservations for meals and lodging should be sent to John B. Smith, South Newbury, Vt. 05066. (Tel. 802-866-3315). County Extension Agents involved are Edward Bouton of Montpelier (Washington County) and Gordon Farr of Chelsea (Orange County).

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- 6 — 1250 gal. S. S. Cheese vats — uncovered.
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- 1 — 4000 gal. glass lined tank

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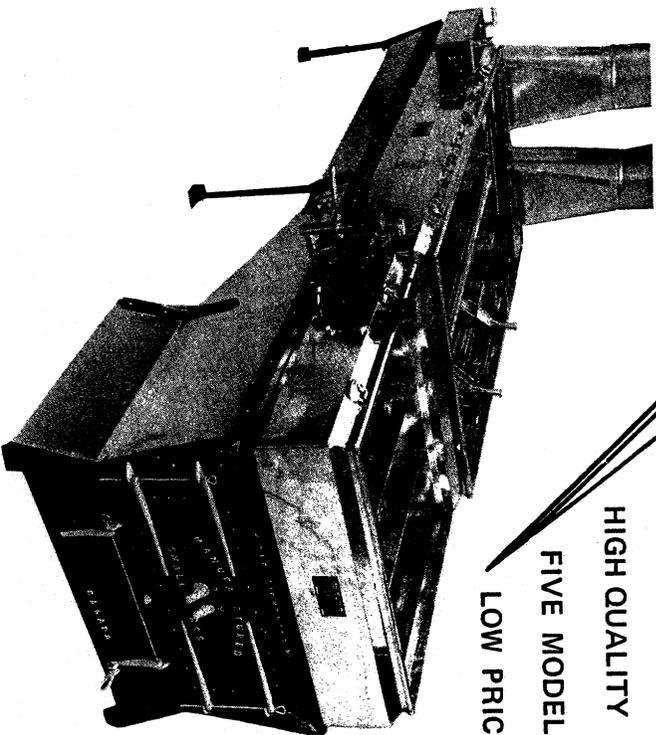
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CAN COLD WEATHER NEGATE BUD EFFECTS?

Robert R. Morrow
Cornell University

The 1973 maple sirup season, with its early March heat wave, was most unusual. Temperatures averaged 15° F. above normal during the first half of March at Lake Placid, New York. Half a crop of sirup was made prior to the usual date of the first sap flow. A normal season's accumulation of heat (summation of mean temperature times duration for portion of day above 35° F.) occurred by early April. Bud break appeared near.

This sequence of events followed:

- (a) March 30 - April 4. Generally warm, temperatures ranged from 31 to 60° F., mean 40° F.
- (b) April 5 - 6. Mostly freezing weather, mean 29° F.
- (c) April 7 - 10. Sap flow weather, mean 30° F. Sirup became progressively

poorer. April 10 sap, with a sugar percent of 1.5 made light amber sirup, but the boiling sap had an off-smell and the sirup an off-flavor. A buddy test was positive.

(d) April 11 - 13. Very cold, mean 20° F. Collecting tanks were cleaned.

(e) April 14 - 16. Sap flow weather, mean 37° F. This flow followed nearly 90 hours of freezing weather. Sap sugar was only 1.4 percent. There was no off-smell nor off-flavor, and three drums of good table grade sirup were made from this thin sap.

Apparently the sharp cold preceding the last run negated the effects of earlier bud activity. The cold was both intense and of long duration. Others have also reported that they believe late cold spells this year negated bud activity.

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Has provided producers with a market for their bulk maple sirup for more than 30 years. If you are interested in selling your bulk maple sirup or in acting as a buying agent, please write, or telephone collect, 802-334-6516.

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The contour of this lightweight jug remains stable even under a vacuum. A pilfer proof cap is featured along with a choice of standard of custom decoration.

For further information contact your jobber, distributor or Kress Creations, 1 DeForest Street, Bldg. 18, Seymour, Connecticut 06483.

J. C. Kissinger
Eastern Regional Research Center¹
Philadelphia, Pennsylvania 19118

The maple producer shares a common problem with every other producer of food products. Innovations in processing and packaging come along and gain acceptance. Then a "new" spoilage problem appears and causes a bit of uneasiness in the industry. The innovation gets the blame, and at times, this is appropriate. However, in most cases, it's the same old microbe doing the damage, and the mishandling of the innovation due to overconfidence or inexperience gives the microbe its chance to cause havoc. Once again the maple industry faces an old microorganism and a new packaging situation. Someone called them "fat" jugs. The term is humorous, but the losses of sirup packed in plastic jugs which ultimately become swollen hurt the pocketbook. The producers tend to blame the container, and this is a natural reaction. Nevertheless, it does not account for the many producers who have no "fat" jug problem. The real problem is as old as the maple industry - certain yeasts will grow in maple sirup, if given the least opportunity. These organisms produce gas when they break down the sugars in the sirup, and the build-up of this gas causes a plastic container to become "fat". Most maple producers never worried about "swollen" cans. The "swell" can was an occasional fact of life in the industry and seldom gave much trouble. On the other hand, the

"fat" jug seems to be a minor epidemic in certain sugar houses.

No single member of the yeast family is responsible for the "fat" jug. Instead, any one of a group of yeasts can do the damage. They are called osmophiles (lovers of liquids of high osmotic pressures like sirup) and grow slowly but well in slightly dilute sirups.² A tiny drop of condensation on the surface of a sirup containing these yeasts will give enough local dilution to start them growing. As they break down the sugars, they produce water as well as gas from the sugar molecules. One might say that they create their own dilute sirup environment. The first inkling that the producer gets of this condition is the "fat" jug, and by that time the damage has been done.

Osmophile yeasts are ever present in our environment. Honey bees are notorious carriers of them, and a maple operation attracts bees. Sugar house interiors and equipment provide excellent areas for the cells to lodge and reproduce, and it is an easy matter for airborne yeasts to find their way into sirup. Stringent cleaning and a regular cleaning schedule will minimize yeast contaminants, but a sugar house cannot be sterilized. Well-placed U. V. lights will protect bulk stored sirup, but they will not safeguard a filling and packaging operation.

This problem can be solved by hot packing. Yeasts are among the most heat-sensitive of all microorganisms.

Text books usually have graphs giving a general picture of the killing effect of heat on yeasts, but we thought that producers might be interested in the effect of heat on one of the original "fat" jug yeasts. A few years ago, Harold Tyler of Westford, N. Y., gave us a sirrup sample which was undergoing a wild yeast fermentation. The organism was identified as a true osmophile, *Saccharomyces rouxii*, by Dr. L. Wickerham of U. S. D. A.'s Northern Regional Research Center at Peoria, Illinois. We have kept this organism in a maple sirrup culture at ERRC because it exhibits spectacular gas production in sirrup. We took a young sirrup culture of *S. rouxii* (10 days old) and heated it to 185° F in a water bath. In the course of heating, samples of the sirrup culture were taken for yeast cell counts as the following temperatures were reached: 72° (room temperature), 120°, 140°, 160°, 180°, 185° F. The results of this work are shown in Table I. Note that even at 160° F, a few yeast cells were left alive. Thus, if cans or jugs had been filled with this sirrup, the results would probably have been "swell" cans and "fat" jugs within 3-4 weeks. At 180° F and 185° F, we did not find any surviving yeast cells. Filling jugs with 185° F sirrup will give some additional insurance that you have an extra 5° Fahrenheit which will help to kill any

yeast contaminants which might be on interior surfaces of the container. Immediately after filling, invert the container or lay it horizontally so that the hot sirrup will kill yeasts on the neck or closure surfaces. Do this before the sirrup has a chance to cool. This will cut packaged sirrup losses drastically.

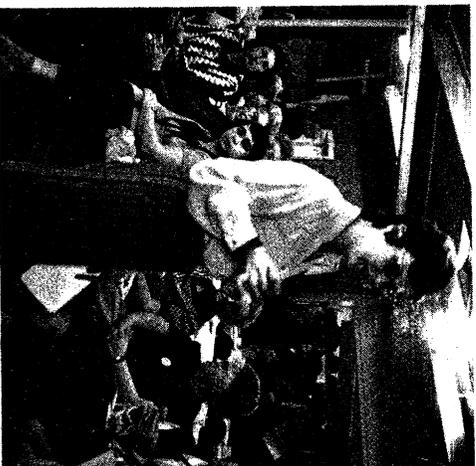
"Swell" cans have never been a major problem, and there might be some psychology behind this seeming superiority of the can over the jug. A hot-filled can is rigid, can be easily handled with padded gloves, and the filler operator expects it to be hot. A hot-filled plastic jug is odd - the plastic is expanded, it seems to slump a little and has too much "give" to it when you pick it up, and who ever heard of hot plastic anyway?? The jug filler wants a rigid, easy to handle vessel when he has finished filling. To get this rigidity with plastic containers, he cuts down on his filling temperature and pays the price in "fat" jugs.

Sirrup must be at 180°-185° F when dispensed into cans or jugs. This temperature must be maintained at all times during filling. Fill from a vessel which can be heated and will maintain the fill temperature. Keep a reference thermometer in the sirrup at all times; and, if possible, use a thermostatically controlled system. At current sirrup

SUGARING OFF

Until the late 1800's, when maple forests became depleted and cane sugar-gained in popularity, maple sugar was the standard sweetener. Indians prepared sugar by putting heated rocks into the sap or by freezing the water out. Today, farmers boil syrup in large evaporators until a clear light amber syrup is ready for marketing.

Making maple syrup and



prices this system will pay for itself in one season. You can pack sirrup in any reasonable container, if you do a good job of hot packing.

¹ Agricultural Research Service, U. S. Department of Agriculture.

² A. H. Cook, page 34.

BIBLIOGRAPHY

1. Cook, A. H., *The Chemistry and Biology of Yeasts*, Academic Press, New York, N. Y., 1958, page 34.

by Linda Clark, Cooperative Extension,

P. O. Building, Delhi, NY 13753

sweet stuff made from maple sap is big business. Thirty-two lively ladies expressed a desire to have a special session on maple product production and promotion in 1974.

Linda Clark, Extension Home Economist in Delaware County, (shown) talked with the "women in maple" at the 1973 Maple School. Time did not allow for much talk but it was decided that for 1974, plans would be made to have at least one hour in a quiet room to share ideas about maple: its history, its versatility, and its value to families today.

In 1972, the Home Economics Division of Extension had produced maple recipe books for producers to distribute in their shops. The 1972 order was 1500, the 1973 order was 2,325. Maple has many uses and these recipes help extend the use of the product.

Many families - especially the children, look forward to sugaring season each year. It's such fun to sink your teeth into some jack wax or invite the neighbors in for a maple sugar stir. Maple sugar is not only delicious on pancakes and waffles, but can be used on ice cream, hot biscuits, jonnycakes, grapefruit, french toast, and all kinds of cereals. Maple sirrup can be used to replace cane sugar in most recipes for added flavor. In cooking, use 3/4 cup maple sirrup for one cup sugar. In baking, use same proportions but reduce the other liquid by 3 tablespoons for every cup of sirrup substituted.

Table I
Decrease in Yeast Cell Count as Yeast-Contaminated Sirrup is Heated From Room Temperature to 185° F

Yeast Count Cells/ml.	Room	Temperature ° F				
	Temp. (72°)	120°	140°	160°	180°	185°
	180,000	120,000	23	7	0	0

MAPLE PRODUCTION

IN NEW BRUNSWICK

by C. F. Harding, Head
Horticultural Division
N.B. Dept. of Agriculture

The Province of New Brunswick has a relatively small Maple Industry. Canada Statistics figures indicate an average annual production of 10,000 imperial gallons of syrup and 35,000 pounds of sugar, etc.

While maple men may be found in most areas of the Province there are three or four centres of production. These groups of producers are located for the most part along the Saint John and Petitcodiac Rivers.

There are approximately three hundred names on our maple producers mailing list. These are located as follows:

Madawaska County Area: 125
York County Area: 50
Albert-Westmorland Counties: 100
Scattered 25

New Brunswick lies on the northern limits of the Maple Industry and we are even more dependent on the vagaries of the climate than most other areas.

Sap season is generally of shorter duration and our trees more subject to the effect of frozen ground, deep snow and to a certain extent, winter injury.

The sap flow in most years is less than that reported in the better areas. Our producers must be satisfied with six to seven imperial gallons of sap per tap in most years. The past season was one of the poorest on record and most operators reported collecting only 3 - 3½ gallons of sap per spile.

EXTENSION AND RESEARCH

No maple research is conducted in the Province. The Provincial Department of Agriculture has employed a Maple specialist, on a part time basis, since the nineteen-twenties.

The Horticultural Division has published a Maple Newsletter since 1962.

MAPLE ORGANIZATIONS

On February 15, 1933, the Maple Producers organized the New Brunswick Maple Producers' Association. This served all producers in the Province until 1969 when the producers were re-organized into three local organizations with the three executive officers of the locals, together with the extension specialist, forming what is called,

-The N. B. Maple Producers' Council.

MARKETING

The bulk of our syrup is sold in glass. Suitable open-stock glass containers are difficult to obtain and the producers have adapted the 16 fl. oz. Kent Jug.

Many producers use a standard label on this container, although private labels are also used by some producers.

Most maple products are sold on local markets, the greater portion being sold directly to users by producers.

The N. B. Maple Producers' Council has actively promoted the use of smaller containers and higher prices. Our Maple men feel they are producing a "Gourmet" product rather than a food product and try to market accordingly.

PROMOTION

Since the organization of local organizations the producers' wives have been accepted to membership, without

dues and we are finding that they do most satisfactory promotion and advertising work.

Promotion Committees comprised of ladies appear on radio and T.V. programs to discuss and demonstrate maple products. They arrange maple displays in such places as tourist resorts and Provincial Parks and they are most successful in arranging tours to sugar camps by such groups as, The Agricultural Committee of our Legislative, the press, etc.

MAPLE SCHOOLS

The Department of Agriculture acting on a request from the Maple Council, sponsored a Maple Short Course in Fredericton in the winter of 1972 and have agreed to hold two this winter. One of these will be conducted in the French Language at Edmundston while the other will be held in Fredericton and will accept English speaking producers.

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Attention

All grades of bulk syrup for sale at reasonable prices; Vermont grades: Fancy, A, and B (light amber, medium amber & dark amber table grades.)

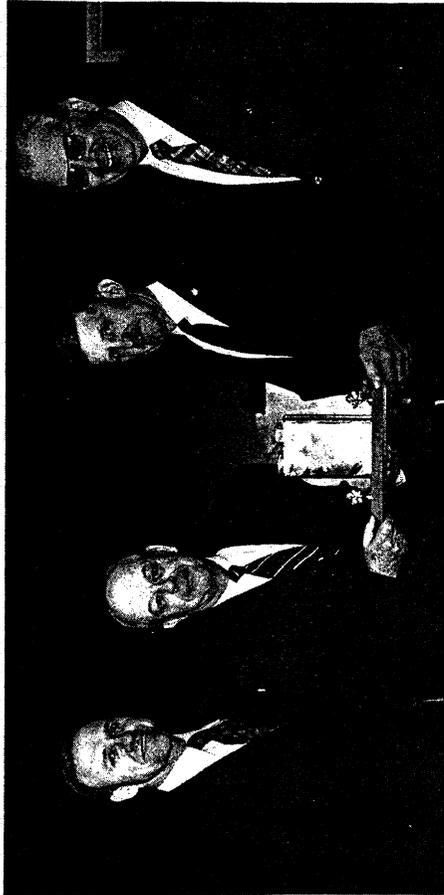
Canadian Producers

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SCIENTIST HONORED FOR CONTRIBUTION TO MAPLE SYRUP INDUSTRY



Left to right: E. P. Farrand, Extension Forest Resource Specialist, Dr. Underwood, E. A. Curtis and James A. Bochy, Somerset County Extension Agent.

Dr. J. Clyde Underwood was presented the "Pennsylvania Maple Man of the Year" award at the annual meeting of the Pennsylvania Maple Syrup Council recently in Harrisburg. Edward A. Curtis, R. D. I. Honesdale, president of the Council made the presentation.

The award is presented annually to an individual who has made significant contributions to the improvement of the maple products industry in Pennsylvania and the Nation. This was the fourth such award presented to maple syrup producers or public employees who work with them.

Dr. Underwood has been a member of a research team devoting full time to the production and processing of maple sap and syrup in the United States since 1955. He was made head of this research group in 1968. The work is being done at USDA's Wyndmoor facility known as the Eastern Regional Research Laboratory of the

Northeastern Area of the Agricultural Research Service.

Included in his numerous research projects have been detailed chemical analyses of maple sap and syrup, determination of the components which make the flavor in maple syrup, a method of producing high-density, high-flavored maple syrup, a method for making fluffed maple products, a test for "buddy" flavor in maple syrup and the development, adaptation and testing of methods for concentrating maple sap by the use of reverse osmosis.

His continued interest and knowledge of maple syrup production has been an invaluable asset to maple producers throughout northeastern United States. He has participated in many workshops and demonstrations in the ten principal maple producing states.

Dr. Underwood has written or contributed to over 40 papers and articles pertaining to maple products

NEIL HANDY
RETIREES



Over 200 friends attended a testimonial dinner last November to honor C. F. "Neil" Handy for his years of service to Lewis County as their County Agricultural Extension Agent. A highlight of the evening was a presentation to Neil by the Lewis County Maple Producers Association with a wood carved reproduction of an American Pioneer carrying two buckets of sap on a wooden shoulder yoke. Mr. Handy was instrumental in the formation of the Lewis County Maple Producers Association and has given many years of sincere devotion and service to the State Maple Producers Association.

and shares in the authorship of three patents in processing maple products.

A native of State College, Pa., Dr. Underwood earned bachelors, masters and doctor of philosophy degrees in agricultural biochemistry at The Pennsylvania State University.

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SAP QUALITY DETERMINES SYRUP COLOR

Proctor Maple Research Group
Department of Botany
University of Vermont
Agricultural Experiment Station

Does the high vacuum on plastic pipelines alter the composition of the sap and the quality of the syrup? A three-year research project, initiated at the Proctor Maple Research Farm in 1970, gave a negative answer to this question. A research report of the first season findings was published in 1971¹. The results of the completed project are in manuscript form and they will be published soon. One of the crucial experiments in the project was to relate syrup color and flavor to the quality of the sap. Since it was impractical to separate, in the evaporator, sap collected by gravity and sap collected from vacuum lines, we developed a technique of boiling samples of sap on a gas heated plate, under controlled conditions. Three separate 2-liter sap samples were taken from each pipeline on each sap flow day. One sample was frozen for future reference, another was used for chemical and physical analyses. The third sample, divided into four 500 ml portions, was boiled in large glass beakers. When 80% of the water was evaporated the sap was combined into two beakers and then into a smaller one, where the syrup was finished to a standard density of 66.5° Brix, as measured by a temperature-compensated refractometer. By this method it was possible to observe the subtle color changes and the time at which they occur during the boiling process of the sap. It soon became obvious to Dr.

Morselli, who boiled several hundred samples, that:

- 1) The physical (color, odor and turbidity) and chemical characteristics of the sap are the results of the history of the sap and will determine the quality of the syrup.
- 2) Different patterns of color changes occur early in the boiling stage of the sap, when it seems possible to predict the color of the final product.

The obvious development was to extend gradually the boiling time, either increasing the initial amount of sap, or adding, at intervals, fresh sap in the beakers. The heat, too, was lowered and the SAP was boiled for two, three or four hours. The resulting syrups had the same color as the syrup obtained from the sap samples boiled on a regular time schedule.

It has been the belief in the maple industry that dark color in the syrup is correlated with boiling time of the sap, i.e. dark color develops when the boiling time is prolonged. There is enough evidence now that, at least in glass beakers and in small volume, syrup doesn't darken with extended boiling time. Preliminary experiments, in which a small amount of fancy syrup was boiled in glass beakers to a concentration higher than standard, support the findings that syrup color doesn't change with extended boiling.

The evaporation of sap to syrup involves many complex reactions as pointed out by Willits and his research group². However, there are indications from our chemical analyses of sap that the initial amount of invert sugars in the sap is a determining factor in the development of the syrup color. Since microorganisms are mainly responsible for enzymatic degradation of sucrose to invert sugars, the sap should be boiled as soon as possible after collection, in order to develop lighter grades of syrup.

Flavors are not mentioned here, since color and flavor are not necessarily correlated. Occasionally known samples of sap have developed Fancy syrups with off flavors, including "bud-dy". Any speculation on the factors responsible for flavors at this time is premature.

REFERENCES:

1. F. M. Laing, J. W. Marvin, Maria-franca Morselli, D. W. Racusen, E. L. Arnold and Elizabeth G. Malcolm. 1971. Effects of high-vacuum pumping on volume yields and composition of maple sap.
Vt. Agr. Exp. Sta. U.V.M. Res. Rep. MP 65.
2. Willits, C. O. 1965. Maple Sirup Producers Manual. Agr. Handbook No. 134. Rev. Ed. Washington, D.C.: USDA Agricultural Research Service.



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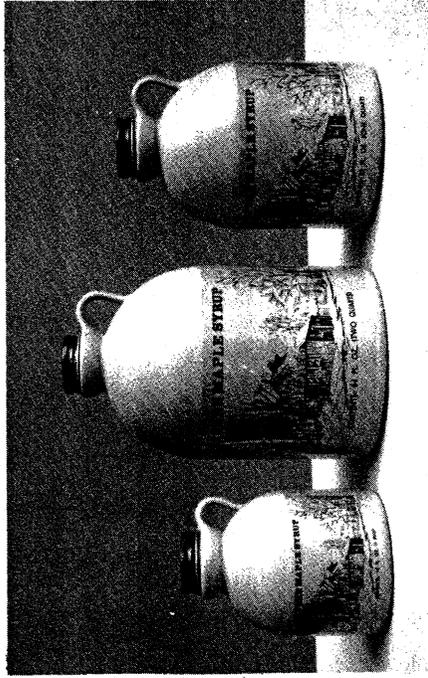
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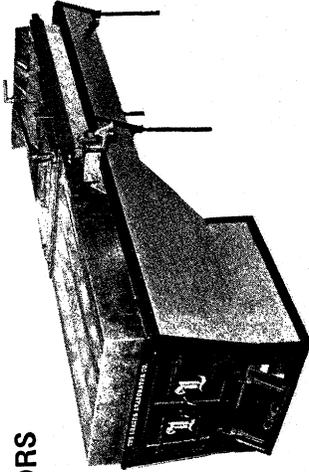
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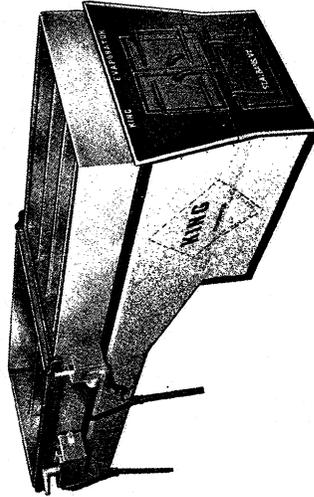
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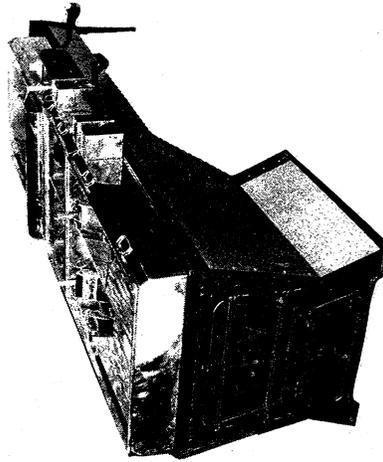
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Sincerely yours,



Bob Lamb