

NATIONAL MAPLE SYRUP DIGEST NATIONAL



Vol. 16, No. 2

July 1977

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COVER PICTURE

Remember When?

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DIGEST ADVERTISING RATES

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ARCHIE'S SUGARBUSH

Dear Editor,

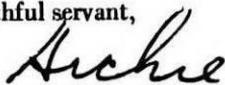
My wife, she says, tell them about our problem in cleaning up after this past years maple run and perhaps someone will have an idea on how to solve it.

We had no trouble with the tubing. We got permission to divert the water going over Niagara Falls for one evening and we ran it through the tubing and flushed it fine and dandy. It took 33 gondola cars to return the clean tubing to storage.

Now the holding tank was something else. The chlorox people agreed to ship in a tank car of chlorox which we used to clean the sides and bottom. And being Scotch, I tried to think of ways to help bring in revenue. I painted parallel lines on the bottom of the tank and rented it for Olympic swimming trials.

But to clean the evaporator, we got a good start by renting the firefighting airplanes from the U.S. Forest Service out of Missoula, Montana to pick up water out of Lake Erie and drop it on the evaporator to flush it out. In no time at all they dropped the water level of Lake Erie 6 ft. and all vacationers and boaters raised holy h—l. We were forced to stop. All boats were running aground. If anyone has any ideas on how to flush the other half of the evaporator, please let me know.

Your truthful servant,



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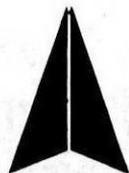
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Experts in the field will give objective advice and recommendations on
Installation & Economics of Tubing Systems and Sugarbush Operation.

Seminar and Tubing Demonstration will begin promptly at 10:00 A. M. at **SHERWOOD FACTORY** located: 40 miles north of Albany, near Glens Falls; from Canada take Route 87 (Northway), from Vermont take Route 4 from Rutland, easy connections from NY thruway.

NOTE, THERE IS NO CHARGE FOR THIS PROGRAM, BUT YOU MUST RESERVE YOUR PLACE BY POST CARD NOW! MORE INFO BY MAIL!!!

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Women's Page

Maple Pecan Squares

1 cup flour

¼ cup brown sugar

1/2 cup margarine

combine these and press firmly in square pan. Bake 350 degrees for 5 minutes.

2/3 cup brown sugar

1 cup maple syrup

combine and simmer for 5 min. Cool slightly.

2 eggs, beaten

2 TB flour

¼ cup softened margarine

1 tsp. vanilla

¼ tsp. salt

2/3 cup chopped pecans

mix these with the cooled syrup/sugar.

Spread onto partially baked mixture.

Bake 450 degrees. for 10 min. then

350 degrees for 20 min. Cool and cut

in squares.

Florence Lamb, Liverpool, N. Y.

Freezing Sliced Peaches

Slice fresh peaches into freezer container and cover with Maple Syrup to within 1 inch of the top. —

Mrs. Merton Wheaton, Rome, Pa.

Mrs. Wheaton also uses Maple Syrup when canning peaches -

1 cup Maple Syrup

2 cups water

We have received several other recipes that will be included in a later issue, So far we have tried 'em all, but I can't keep that up or THE BOSS won't have room for me in the car when we go to the fall N.A.M.S.C. meeting in Maine !! Thank you - everyone, for the good response.

BUDDY SYRUP

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INVITATION TO ALL OUR FRIENDS IN MAPLE

We will be celebrating our 50th Wedding Anniversary
Saturday, September 24th, 1977
and would enjoy having you with us for this occasion.

We will be at Melody Mill Ballroom (just across from the Sugar House).
Open House - 2 to 5 p.m., Dinner at 5:30
Dancing - 8 to 12.

Drop a card or phone by September 19th for planning dinner.
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COMING EVENTS !!

1977 N. Y. MAPLE TOUR

The annual N. Y. Maple Tour will be held August 17 and 18 in Clinton County. This is the first Maple Tour to take place in this county.

Registration will be at the Miner Institute Demonstration Sugar Bush near Chazy, N. Y. Here is an opportunity to see a tubing operation on vacuum, sugar bush thinnings, and several new ideas and innovations. Other stops will highlight good roadside marketing, tubing installations, on shallow slopes, and modern sugarhouses. A sugarbush management thinning demonstration by Dr. Robert Morrow of Cornell University is also planned as part of the tour.

For more information and a copy of program, write to: Lewis Staats, Att: Karen Milligan, Dept. of Natural Resources, Cornell University, Fernow Hall, Ithaca, N. Y. 14850.

AMERICAN MAPLE MUSEUM

The newly established American Maple Museum had its grand opening May 28, 1977, and Fred Winch was inducted as the first member into the Museum's Hall of Fame.

Those who will be traveling to or from Maple tours or the North American Maple Conference, may want to stop and visit the American Maple Museum.

It is located in Beaver Falls, N. Y. which is just east of Watertown, N. Y.

Hours of the museum are:

Monday

Thursday

Friday 10:00 A.M. to 4:00 P.M.

Saturday

Sunday 1:00 P.M. to 4:00 P.M.

Also by special appointment.

12TH VERMONT MAPLERAMA SCHEDULED

One of the most interesting Vermont Mapleramas, or State Maple Tours, yet to be scheduled will be held in Franklin County, Vermont on Friday, August 19 and Saturday, August 20. Beginning in Georgia, Vt., just south of St. Albans, the tour will continue to Swanton, where it will visit tree thinning operations and improved evaporation techniques of Jean - Marie Laroche; a phosphate rock discovery and sugar bush on the farm of Marcel Laroche; the Leader Evaporator Company, where latest methods of equipment manufacture will be seen; and a new whey plant which processes the formerly wasted whey into useful products, thereby preventing water pollution. Other stops will include a modern sugar house using most of the latest equipment; a large modern dairy barn; a sugar bush operated by Alan Kittell of Enosburg, Chairman of the Maplerama; and the sugar house of Arthur Toof, Jr. of Cambridge. Conducted this year in conjunction with the Franklin County Field Days, the Maplerama will feature exhibits, a banquet, and horse racing at the Field Days Grounds on Friday evening.

Sponsored since 1966 by the Vermont, Maple Sugar Makers Association, the Extension Service at the University of Vermont, and local sugar makers' associations, the Maplerama also receives support from the Vermont Department of Agriculture and the Vt. Department of Forests and Parks. Between 200 and 300 persons, mainly sugar makers, are expected to attend

this year. Reservations should be made by writing to Donald J. McFeeters, Secretary, Extension Service, Box 109 Post Office Building, St. Albans, Vt. 05478.

PENNSYLVANIA MAPLE TOUR

The Northwestern Pa. Maple Association will be host for the Pennsylvania maple tour, to be held Friday Sept. 30 and Saturday October 1, 1977.

Headquarters will be the Riverside Inn, Cambridge Springs. There will be buses for the tour.

The highlights of the tour: Visit the Pheasant Farm, Drakes Wells, Corry Fish Hatchery, Thompson Maple Products. In addition to two sugar camps.

Further information will be sent to your local county agents later or for further information contact. Mrs. E. Running Secy., R.F.D. 1, Cambridge Springs, Pa. 16403, or Joseph S. Beard County Agent, Basement Court House Meadville, Pa. 16335.

WISCONSIN MAPLE TOUR

"The 1977 Wisconsin Maple Tour, will be held on Saturday, October 1. Maple producers in the rolling hills of western Wisconsin will be our hosts. This year saw one of the largest sap flows ever! Come share your experiences.

Registration will be 9 - 10 A. M. at the Barron County Historical Museum, in Barron, Wisconsin. For more information, contact Norman Anderson, Rte 3, Cumberland, Wi, 54829, or Barron County UWEX, Courthouse, Barron, Wi 54812.

N. AMER. MAPLE SYRUP COUNCIL

The next annual meeting of the North American Maple Syrup Council will be held at the Eastland Motor Hotel in Portland, Maine on October 17, 18 & 19, 1977. More information will be sent out to the Council mailing list some time in August. If you do not receive it then, write to William Buckland, Maine Maple Producers, Assoc., Gorinna, Maine 04928.

MAPLE SYRUP: Production, Price and Value, 1976 and 1977¹

STATE	Production		Price		Value	
	1976	1977	1976	1977	1976	1977
	1,000 gallons		Dollars		1,000 dollars	
Maine ²	7	8	13.70	14.80	96	118
Mass.	27	27	12.75	13.00	344	351
Michigan	69	90	12.80	13.40	883	1,206
N. H.	57	74	13.55	13.80	772	1,021
N. Y.	277	320	10.90	10.60	3,019	3,392
Ohio	50	88	11.50	12.00	575	1,056
Penn.	40	47	10.60	11.20	424	526
Vermont	334	437	11.00	11.50	3,674	5,026
Wisc.	66	130	12.90	11.90	851	1,547
United States	927	1,221	11.48	11.67	10,638	14,243

¹ Preliminary.

² Does not include quantities produced on non-farm lands in Somerset County, Maine.

A COMMERCIAL UNIT FOR REMOVING BUDDY FLAVOR FROM MAPLE SYRUP

Claude H. Hills
Eastern Regional Research Center*
Philadelphia, Pennsylvania 19118

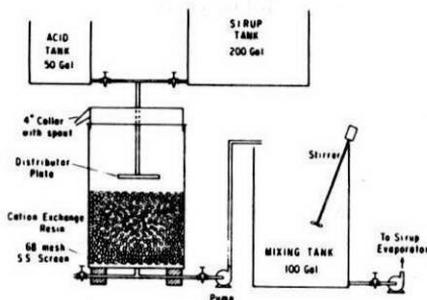


Figure 1: Diagram of Commercial Unit for Treating Buddy Maple Sirup.

In 1975, Hills and Bell (1) described a laboratory procedure for removing the off-flavor from "buddy" maple sirup. The process uses an ion-exchange resin to remove amino acids, believed to be responsible for the development of the buddy flavor and odor. The present report describes a small portable unit which was used successfully on 1040 gallons of buddy maple sirup at the sugar house of Arthur Merle, near Varysburg, N. Y. in May 1976 and 1000 gallons of sirup at Mountain Meadow Farm, Schellsburg, Pa., in December 1976.

Fig. 1 shows a diagram of our portable unit constructed from a 55-gallon stainless steel drum fitted with a 1" bottom drain and two valves, one for removing effluent and one for introducing water for backwashing. A 68-mesh stainless steel screen and a 4-mesh screen (for support) were placed on a false bottom to provide drainage. A rubber gasket was used to make a tight seal between the edge of the screen and the drum to prevent loss of resin granules (about 50 mesh). The tank was filled approximately one-half full with 3.5 cu. ft. of a cation exchange

resin, Amberlite 252** (Rohm and Haas Co., Philadelphia, Pa.). A 4-inch metal collar with a spout for overflow was welded into the top of the tank to facilitate backwashing.

The diagram shows 2 feed tanks, one for acid to regenerate the column and one for sirup. These tanks may be elevated for gravity flow; if placed at floor level, pumps will be needed. A distributor plate is desirable but not essential. There was very little disturbance of the resin bed when a liquid head of 6" or more was maintained.

A galvanized steel sap tank would be suitable for the 200-gallon sirup tank, but all the other tanks must be acid resistant, either stainless steel or plastic. An additional 10- to 20-gallon steel tank is needed for preparing the 40% sodium hydroxide solution used for neutralizing the sirup effluent. If the sirup tank is at floor level, an additional pump will be needed, making a total of three.

For efficient operation there should be three 100-gallon mixing tanks: two for collecting and neutralizing the sirup before it goes to the evaporator and one for collecting and neutralizing the acid washings.

Outline of Process

Regeneration: The cation resin must be regenerated (freed of cations) prior to use. Two bed volumes (approximately 50 gallons) of 5% HCl was percolated through the resin bed at a rate of 3 to 4 gallons per minute. The acid effluent plus about 50 gallons of rinse water were collected in a 100-gallon tank and neutralized to pH 6 to 7 with hydrate of lime and then discharged to the floor drain.

Operation: Each batch consisted of about 100 gallons of buddy sirup diluted with 50 gallons of tap water. It is desirable to use hot water or to heat the mixture to 80° F or above to achieve a satisfactory flow rate of 2 to 3 gallons per minute. The sirup level should be maintained at 6 to 12 inches above the resin bed.

The initial 15 or 20 gallons of effluent (water and sirup below 2° B) was discarded. The next 5 to 8 gallons (2° B to 10° B) was saved to add to the next batch. When the effluent reached 10° B it was pumped into the mixing tank. Similarly, at the end of a batch, the rinsings above 10° B were added to mixing tank and those between 10° B and 2° B were saved and added to the next batch.

The effluent (pH 1.8 to 2.0) was monitored with a pH meter. When the pH rose to 3.0, the operation was terminated because the column was becoming saturated with cations and buddy-flavored sirup would start coming through. If a column becomes saturated, any sirup in the ion-exchange column plus rinsings must be removed and added to the next batch. Once the capacity of a column is determined, it is best to use batch sizes about 20% less than capacity to avoid problems of handling the excess sirup and rinsings.

The sirup effluents were neutralized with 40% sodium hydroxide (food grade) to pH 6.5 and evaporated to 66° B using a commercial oil-fired evaporating pan and a gas-fired finishing pan.

Backwash: The resin bed was backwashed with tap water for 5 to 10 minutes with sufficient volume to cause a 50% bed expansion. The overflow was screened through a 68-mesh wire screen and any granules collected were returned to the resin tank. The column was then ready to be regenerated for the next batch.

Results

Batches of 100 gallons of sirup (plus 50 gallons of water) were processed each half day. When cold water was added to the sirup, the flow rate was only 1 to 2 gallons per minute. By heating the mixture to 100° F the flow rate was increased to 2 to 3 gallons per minute. A batch required about 3 hours and the services of two men, one operating the ion-exchange column and one operating the sirup evaporator. Additional time was required to mix and warm the sirup at the start and for cleanup at the end of the day. Records

TABLE I

Equipment and Supplies

1 55-Gallon SS tank, screen, valves	\$ 325.00
1 4-cu. ft. Cation-exchange resin	208.40
1 pH meter and spare electrode	159.00
1 Stirrer, 1/15 HP	85.00
3 Pumps	199.60
3 100-gallon plastic tanks	437.25
1 55-Gallon plastic tank	58.00
1 15-Gallon SS pot	104.00
1 200-Gallon galvanized tank	120.00
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Misc. - Thermometers, hydrometers, tubing, clamps	93.75
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of all fuel consumed were kept.

After treatment, all samples were free of off-flavor and off-odor and were judged to have a weak but typical maple flavor. There was a reduction in brown color of the final sirups, averaging 20% as measured on a Beckman Spectrophotometer at 550 m μ .

Cost Estimates

The equipment and supplies required for a small commercial unit to process 200 gallons of buddy maple sirup per day are listed in Table I. It would be necessary to operate the equipment at a sugar house in order to have facilities for evaporating the product back to sirup density (66° B). Some tanks, pumps and miscellaneous items may be available at a sugar house and would not need to be purchased. However, for a portable unit it would be best to acquire all the items listed.

Table II lists the quantities and costs of chemicals and fuel used per 100 gallon batch. These prices are for December 1976 but are likely to increase rapidly in the next few years.

TABLE II

Quantity & Cost of Chemicals & Fuels*
(per 100 gallons sirup)

Sodium hydroxide, 8 lbs. at 93c	\$ 7.44
Hydrochloric acid, 50 lbs. at 7c	3.50
Hydrate of lime, 14 lbs. at 4c	.56
Fuel oil, 36 gallons at 43.9c	15.80
Bottled gas, 17.5 lbs. at 16c	<u>2.80</u>
	\$30.10

*Prices as of December 1976

Table III shows a total processing cost of \$0.84 to \$1.07 per gallon. This does not allow for a margin of profit or for travel costs for an operator with a portable unit.

Until the market for buddy sirup becomes well established, it would

seem best to have a portable unit traveling from area to area, wherever there is an accumulation of buddy sirup. Eventually maple sirup processors may wish to extend their season and increase their production by deliberately making buddy sirup, knowing that they can convert it into a marketable product.

TABLE III

Estimated Cost of Cation-Exchange Process (per 100 gallons sirup)

<u>FIXED COSTS:</u>	<u>LOW*</u>	<u>HIGHT</u>
Fuel and chemicals	\$30.10	\$ 30.10
Electricity for hot water	1.00	1.00
Labor, 8 hrs. at \$4	32.00	32.00
Rental, sugar house, \$20/day	10.00	10.00
Spillage, 1 gallon at \$5	5.00	5.00
<u>VARIABLE:</u>		
Interest on investment \$1990 at 9%	1.79	8.95
Amortize, 5 years	3.98	19.90
	<u>\$83.87</u>	<u>\$106.95</u>

*Based on 10,000 gallons/year

†Based on 2,000 gallons/year

The U.S. Food and Drug Administration has approved the use of ion-exchange resins for food (including maple sirup) manufacture. Also, the U.S. Agricultural Marketing Service has ruled that maple sirup treated by the ion-exchange process can be marketed as "pure" maple sirup. However, since some state food laws differ from the Federal regulations, it would be advisable for manufacturers to consult with their State food regulatory agency before attempting to sell maple sirup treated by the ion-exchange process.

- (1) Hills, Claude H. and R. A. Bell, Jr. Removal of Buddy Flavor from Maple Sirup. National Maple Syrup Digest 14(1):12-13 (1975).

MAPLE MUSEUM



Fred Winch talks to Xurd Smith and Gordon Brookman, New York Maple Producers, at the opening of the American Maple Museum

AMERICAN MAPLE MUSEUM OPEN

The American Maple Museum, Beaver Falls, Lewis County, N. Y. had its Grand Opening on May 28, 1977. The museum will be open every day except Mondays.

The Lewis County Maple Producers would like to invite everyone to visit the American Maple Museum. There is an excellent display of maple equipment along with a nice gift shop.

Professor Fred Winch was inducted into the Maple Museum Hall of Fame on the 28th.

Anyone who knows of or has any maple items, we will always be looking for them for the museum.

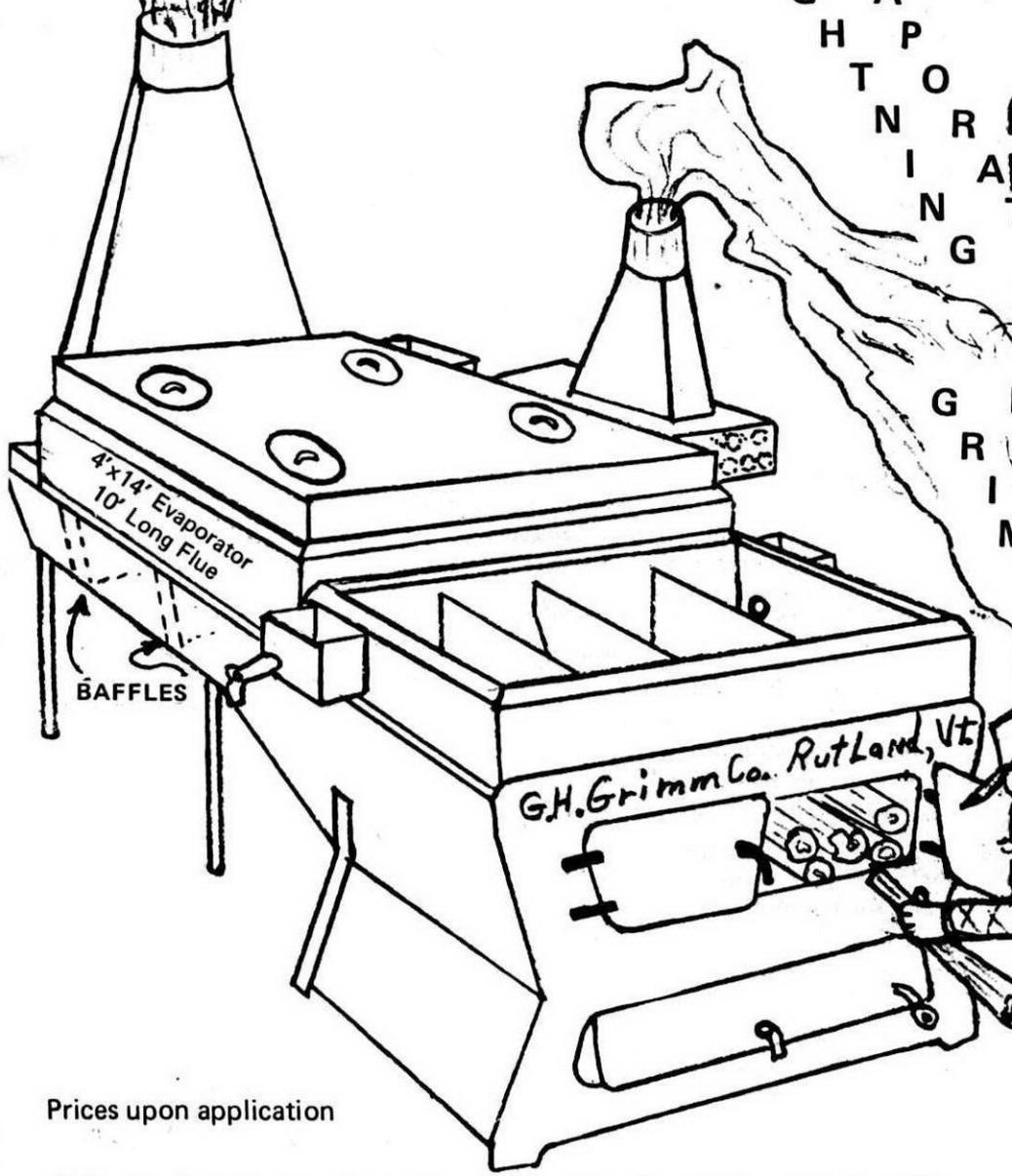
Sincerely,

Hugh E. Worden
Cooperative Extension Agent

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PREHEATER



Eleven Regional Maple Schools Held



by Hugh E. Worden

Eleven regional maple schools were held during January throughout New York State, through combined efforts of Lew Staats, County Cooperative Extension Agents, and the Maple Producers Associations in New York State. The major program development and presentation was carried out by Lew. Mr. Staats is a Regional Extension Specialist working out of the Uihlein, Cornell Experimental Sugar Bush at Lake Placid, New York.

This years schools were held in Alleghany, Chautauqua, Wyoming, Chenango, Delaware, Cortland, Otsego, Lewis, St. Lawrence, Clinton and Washington Counties. Over 800 people attended these schools. In the above photo (left) Lew Staats is discussing the use of plastic tubing in sap collection to the group in Lewis County. The photo (right) Bruce Schneider, senior forest technician in forest insect and

disease control, and Daniel Richter, Forestry Technician, from the Lowville regional DEC office has an excellent display of forest insects and disease. Bruce also made a presentation of some of the work they are doing in the area with insects and disease in maple bushes.

Other items discussed and demonstrated this year were the proper use of maple syrup grading kits; 1977 maple syrup market; new developments in maple equipment; proper canning techniques; progress of maple museum; plus much time for discussion and questions.

I feel the maple producers in New York State are fortunate to have a person like Lew Staats, who is dedicated and willing to help the maple producers of the state. These schools he holds each year provides an excellent opportunity for the producers to get the latest information on maple production.

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Mrs. Les Jones Holcombe, Wisconsin

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MAPLE MAN OF THE YEAR

Orville A. Yoder, Bradford County Extension agent, today was named recipient of the Maple Man of the Year Award presented by the Pennsylvania Maple Syrup Producers Association.



The award was presented to Yoder by Edward A. Curtis of Honesdale, Wayne County, president of the Pennsylvania Maple Producers Council during activities at the 61st Farm Show.

Yoder was cited for his outstanding programs and accomplishments in the maple products industry. He helped

organize the Endless Mountains Maple Producers Association and Pennsylvania Maple Producers Council.

He encourages the use of newer production methods, proper use of equipment, and improved marketing techniques.

In Bradford County he organizes educational tours, demonstrations, and industry meetings. He also works individually with maple producers in producing and marketing quality maple products.

He is the ninth man to receive the Maple Man of the Year Award.

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TIPS ON QUALITY CONTROL

by Everett A. Willard
Vermont Dept. of Agriculture

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TAPPING

3 inch tap holes in sound wood. Do not use tap holes when dead wood shows. One dead wood tap hole may spoil flavor in much sap and syrup.

DO NOT

Do not use any smelly household detergent or soap. Can cause off flavors and rejected syrup.

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AND BOILING TIME?**

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GAS BURNERS**

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Fair prices — one barrel or one thousand — all grades.

ALWAYS PACK ALL SYRUP HOT

Cold pack has caused more spoilage than almost any other cause. It has been determined that 180 degrees F., when the cap goes on, is the safest lower limit for hot packing syrup. Syrup which is left uncapped for a few moments can cool enough and collect enough yeast and mold spores from the air to spoil a few cans in an otherwise perfect lot, which is one reason why only some "cold pack" cans spoil in a given lot. After capping the 180 degrees F. syrup, immediately lay each package on its side, neck down, in order to sterilize the air pocket and check the closure for leaks. Keep checking with thermometer just ahead of the syrup's entry into the package. Heating above 185 degrees F., can cause cloudiness unless the syrup is refiltered. Always use a tool, not just your hand to tighten screw caps. Inner seals are not 100% airtight. "Stack burn" in freshly canned syrup can change a low Grade A syrup to Grade B, unless cans are cooled quickly. Space cans apart on cold surface. Do not carton while warm, always store cans on side.

HOT PACK SYRUP

For best results - heat syrup in a continual flow, not in a vat. High quality syrup may stand vat heating without color change and gain very little niter flavor. The last fourth of the average vat heated syrup gains froth and niter while deteriorating in flavor and color. All of the syrup continually flowing through several divided compartments while heating retains most of the original flavor and quality.

CARE OF SYRUP

Can or pack in small retail containers only that amount of syrup that you will sell within the next few weeks, not over 3 months.

Stored small containers may lose sales appearance, and the syrup may lose flavor, color, and even grade.

WARNING

Do not use under any circumstances any dairy iodine base sanitizer. It has completely ruined much syrup. A complete loss.

SANITIZER

1 part Clorox or equivalent to 20 parts clean water for rinsing. Drain and dry. Do not use stronger than recommended or let solution set in galvanized equipment as flavor problems may result.

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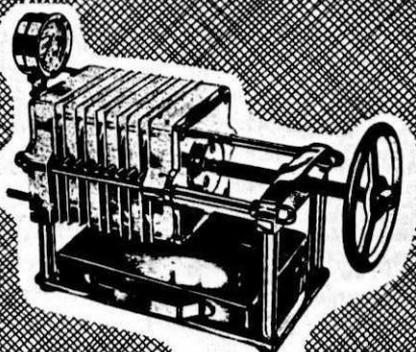
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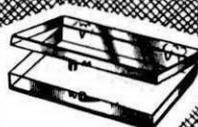


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For Buckets and Tanks



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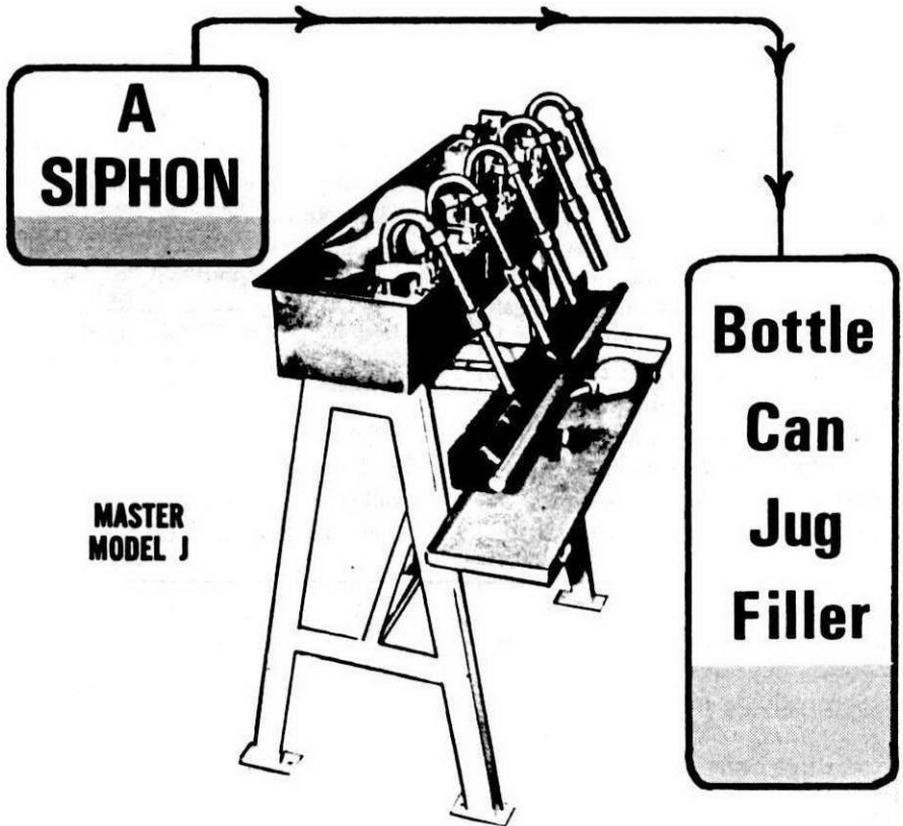
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OUR CATALOG SHOWS LOTS OF THINGS!

IMPROVING EVAPORATION EFFICIENCY

Robert R. Morrow, Professor of Forestry
Department of Natural Resources Cornell
University.

Lewis J. Staats, Uihlein-Cornell Experimental
Sugar Bush Heaven Hill Farm.

Preheaters, properly installed, can save some 15 percent on fuel costs and time needed for evaporation of sap to sirup. Some producers found another advantage during the past season. Preheaters speeded evaporation during and after heavy flows on warm days, reducing sap deterioration and increasing sirup quality.

For several years, our series of three oil-fired evaporators at Heaven Hill (Lake Placid, NY) needed a gallon of oil for every 10 gallons of sap. The three burners used a total of 35 gallons of oil to evaporate 350 gallons of sap each hour from the raised-flue pans. After installing and adjusting a preheater,¹ the same amount of oil usually evaporated just over 400 gal-

lons of sap per hour, a gain of about 15 percent.

Last winter we installed one new pan with deep flues (7.5 rather than the more normal 5 inch depth). The manufacturer suggested that it might be 8 percent more efficient. Consequently the expected hourly evaporation rate was calculated as follows:

	Burner rate	Sap- oil ratio	Evap. rate
Deep flue pan	12 GPH	10.8	130 GPH
Norm. flue pans	23 GPH	10.0	230 GPH
Preheater gain (360x.15)			54 GPH
Total			414 GPH

For the 1977 season we used 4,320 gallons of oil to evaporate 51,050 gallons of sap in 123.5 hours. This

American Maple Products

- produces maple sirup, Newport, Vermont 05855
- buys bulk Maple Sirup from other producers,
- packs Pure Maple Sirup,
- makes Maple Candies, Maple Sugar and Maple Butter,
- wholesales these products to the retailer
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CAN WE HELP YOU WITH YOUR MAPLE REQUIREMENTS?

amounted to 413 gallons of sap per hour from 35 gallons of oil. If our measurements were correct, the actual rate proved to be nearly identical to the calculated rate.

Had we installed three new-flue pans, the expected gain in efficiency (from both deep flues and preheater) would be about 24 percent ($1.08 \times 1.15 = 1.24$) and sap evaporation of 435 gallons per hour would be anticipated.

Note that the gain in efficiency from deep flues is modest, and it comes at a high cost. On the other hand a preheater offers more efficiency at a

cost that can be recovered in fuel savings in only 2 to 4 years. In our 50,000 gallons-of-sap operation, for example, the annual oil consumption is reduced from 5,000 to about 4,350 gallons by the preheater alone. Multiply the annual savings of 650 gallons of oil by the current price and there's only one conclusion - either buy or build a preheater.

1. "Adjusting and testing a sap preheater" by Robert R. Morrow. New York's Food and Life Sciences Quarterly, Vol. 8, No. 3. 1975.



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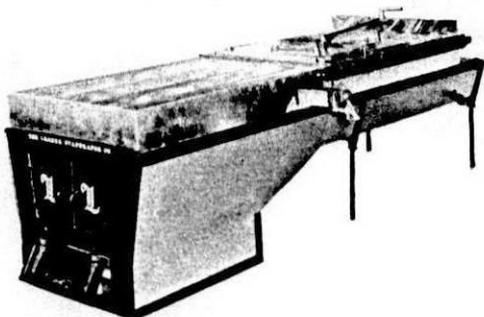


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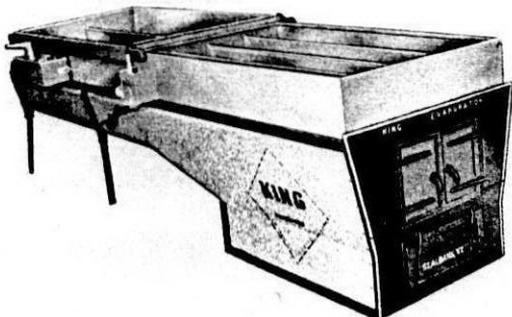
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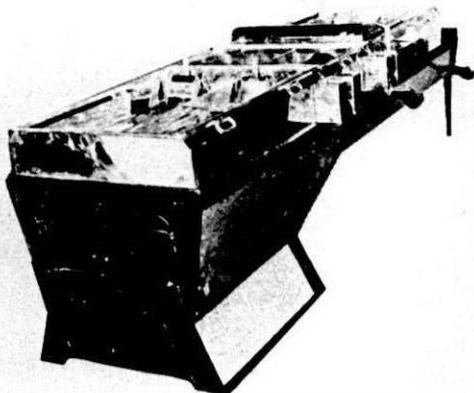
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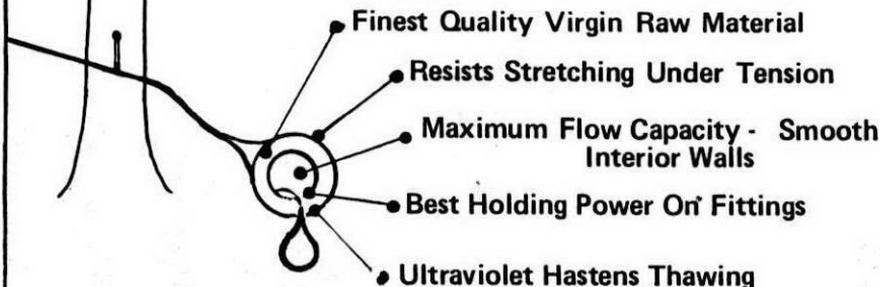
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Sap

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