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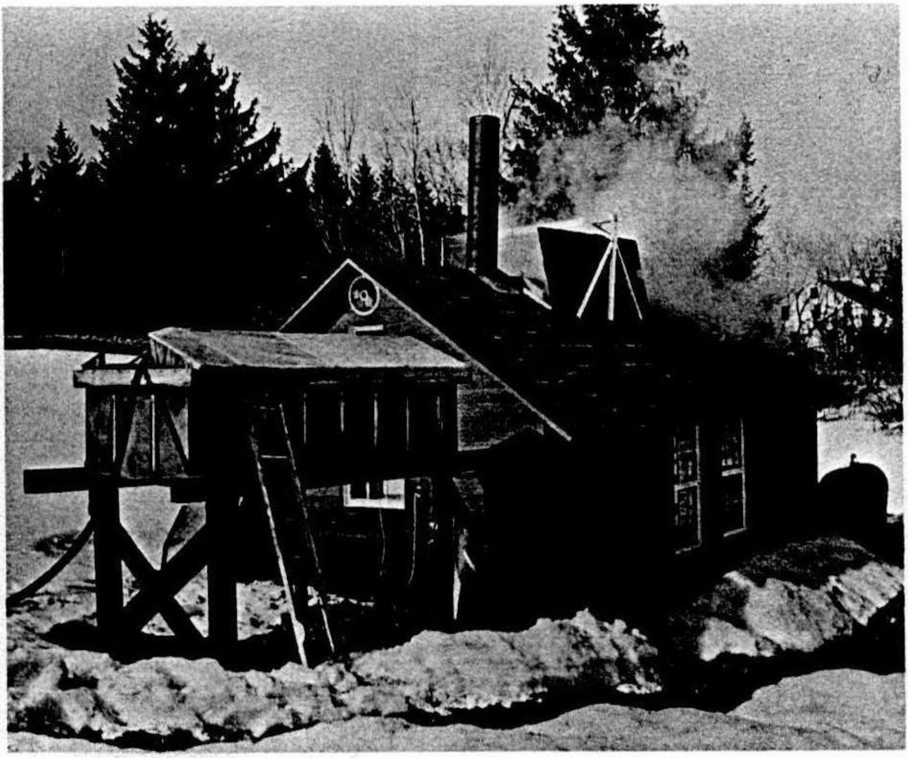

Vol. 22, No. 2

July 1982

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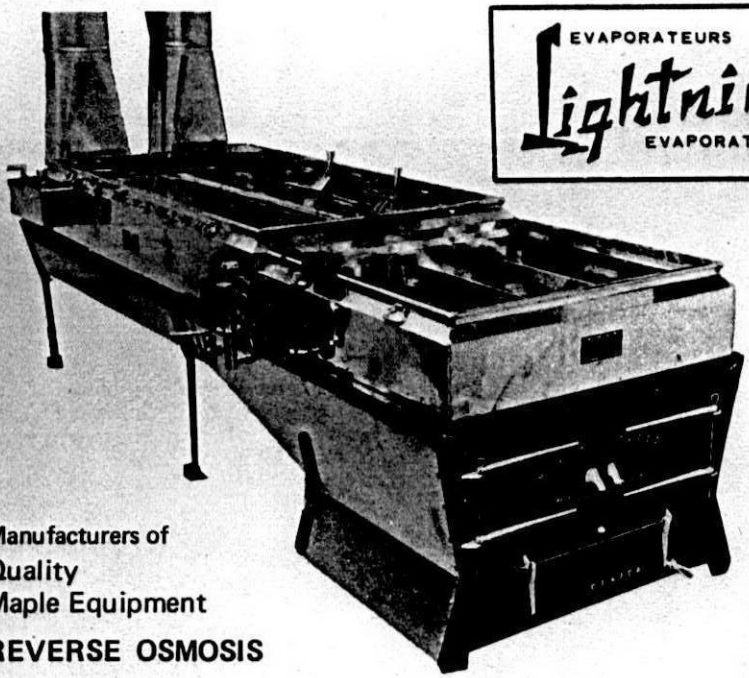

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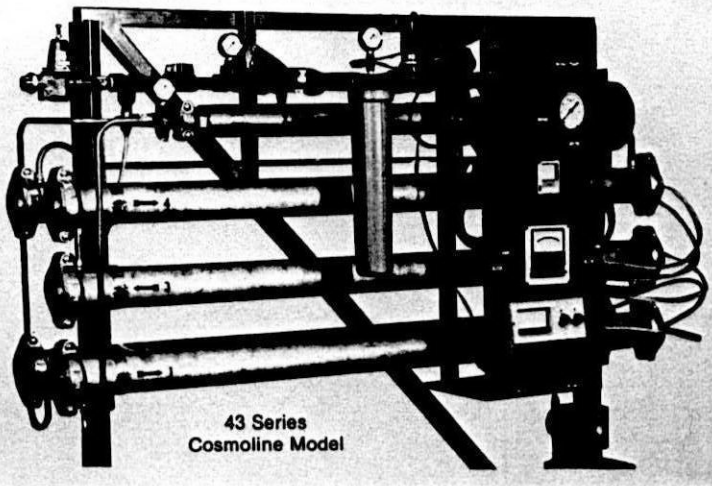

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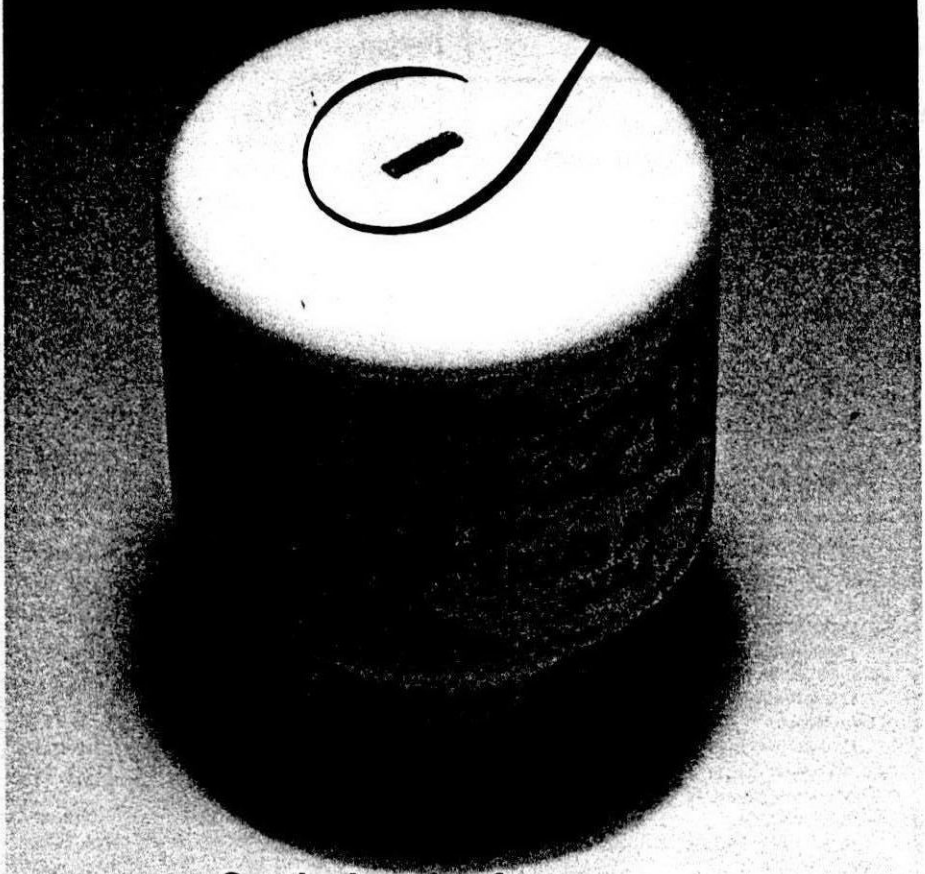

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Published & Edited by: Lloyd H. Sipple
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Phone: 607-967-7208

Published four times a year.
(Feb., July, Oct., Dec.)
Postage
Paid at Bainbridge, N. Y. 13733
Mailed outside our cirulation area for $3.00 per Year.

York

Printed by:
YORK MAIL-PRINT
Mill & Watson Sts., Box 488
Unadilla, New York 13849

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John C. Andrews Sugarhouse
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This picture won 1st prize in the New York photo contest, 1981

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Editorial

FROM THE CHAIRMAN

Well, Mother Nature kept up her consistency by being inconsistant when she puts together a sugar season. I hear different stories from whoever I talk with. The biggest difference between the past two seasons was the grade of syrup produced. Over all, producers pointed out their frustrations in not being able to make light amber syrup. Not everywhere though, for some produced predominately light syrup. Some high elevations did real well and some high places had a disaster.

As 1982 total production statistics are not available yet we don't know exactly how to assess the crop in relation to the surplus from the 1981 crop. Perhaps some of our experts might have comments as to the cause for these great variations in maple production. A great number of conditions will enter into the economics of maple this coming year. A few might be: surplus product, rate of interest, rate of exchange between the U. S. and Canada, insect and disease problems plagueing the industry, the acid rain dilemma, and the large scale sale of false or adulterate products being sold as maple syrup.

The 23rd annual meeting of the North American Maple Syrup Council will be held October 25, 26 and 27 at the Quail Hollow Inn near Burton, Ohio. Ture Johnson will be getting out info on reservations for this meeting. The International Maple Syrup Institute will also meet at this time and place.

The most pressing problems will be aired at this meeting and anyone who has pertinent information regarding the maple industry should get in touch with the chairman. Information is requested for: insect control, acid rain and its relation to maple, false labeling and what we might do about it, and the surplus of syrup and its solution.

The best solution to these and other problems can be best realized by a strong Council and by the desimination of Information through the Maple Syrup Digest. If you know a neighbor who doesn't get the Digest, tell him its a good investment.

Russ Davenport

Increased Profits Cut Energy Costs

by Les Driggs

For a while it looked like we were not going to make it. A lot of people are interested in cutting fuel oil costs in the mid to small size sap houses, but inquiries to foundations and associations around the nation, at first, didn't turn up a dime.

Fortunately, the A. Lindsay and Olive B. O'Connor Foundation, the Agway Foundation, and the Richard and Rebecca Evans Foundation (all from New York State), the NYS Energy Office and the NYS Department of Agriculture and Markets were able to help.

An energy conservation project was started this season auditing a representative sample of 15 mid to small sized operations, nearly all oil fired, involving 25 evaporators.

Gary Hollen, of the New York State Department of Agriculture and Markets and Cliff Wassel of the State Energy Office followed up energy audits carried out by qualified heat conservation engineers. What they found would blow your stack . . . temperatures that is. While we were looking for a stack temperature, indicating burner efficiency, at about 400°F, we found them to range mostly from 650° to 950°F. The average evaporator in the test could save, with very small investment, about 30% of its fuel oil costs in burner efficiency alone. The study also reveals several other opportunities for significant savings at low implementation cost. A surprise . . . those units on the upper end of mid size could save proportionately more.

The results from these audits and recommendations will not only be given to the 15 cooperating maple house operators, but will be published in the form of a HOW-TO-DO-IT-MANUAL.

Editors Note: We are proud to report that the first printing of these HOW-TO-DO-IT chapters in a trade publication will be in the Maple Digest commencing in October.

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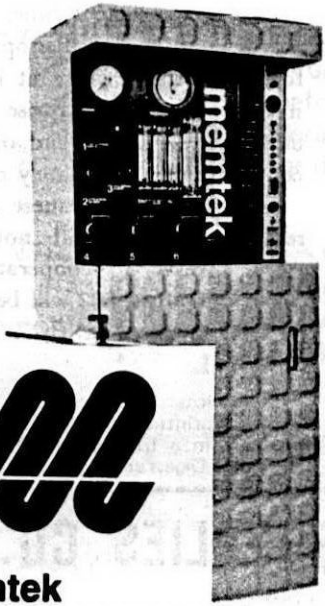

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All equipment was designed around our vertical membrane concept, permitting easier draining and cleaning of the system. Other special features include: insulation, internal heater, simple instructions, concentrate control valve, readable gauges and meters, automatic safety and shut-down controls, as well as dependability.

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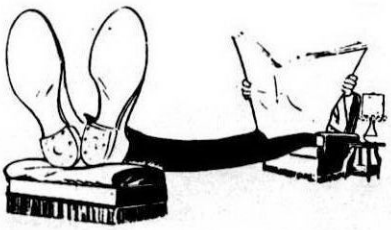

That is what it would be if all the government sponsored maple research facilities got their heads together.

We are very fortunate to have maple research being conducted in the areas covered by the North American Maple Syrup Council. However, it does seem that if they got together and pooled their efforts under a central headquarters they could be much more effective.

Since 1973 energy crisis, maple production has been a whole new ball game. Like any other phase of agriculture, it is directly affected by energy, labor, interest and equipment costs. Many producers are trying to reduce these costs by installing new, very complicated mechanical and electronic equipment. This equipment is often like my toys. When they are new, all is well. As the years roll by the honeymoon is over and all hell can break loose.

A well planned, on the job research program with exhaustive tests covering all phases of the use of this equipment would make sense. It is better to be prepared for the future than just wonder what happened. In other words, give people answers, not calculated predictions.

The manufacturers of this equipment would be very cooperative. It would build prospective customers confidence, improve their products and increase sales. Who knows, there can very well be a simpler and less expensive way right around the corner. Trained researchers and manufacturers in the past have found answers and solved many problems for us, and anyone who says we don't need research is terribly near sighted. The easiest thing in the world is to give up hope and stop trying. There is always an answer and a better way.

It seems that the University of Vermont with all their facilities, as well as the Jones Laboratory located at the Proctor Research Farm, could be the cooperative research headquarters. Their staff is also more than adequate. Here, our researchers could get together a couple of times a year, eyeball to eyeball, to plan and report their ventures. With all of the ability these people have, research could be more productive and with less duplication.

There are no phases of the Maple Industry that can not stand improvement. For that matter, some will have to be changed for maple to survive. This is not an exaggerated statement. We have to face up to our changing time and look ahead.

Bob Lamb

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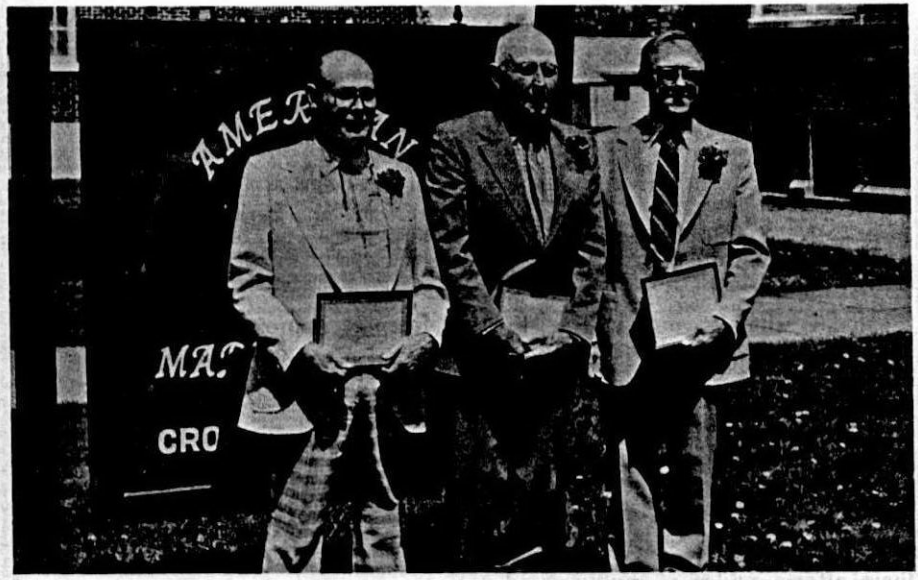


HALL OF FAME INDUCTEES

The American Maple Museum held its annual Maple festival on May 15 and 16. Highlights of the festival was the induction into the Hall of Fame of three new members and crowning of a State Maple Queen.

Those inducted into the American Maple Museum Hall of Fame for 1982 were (from left to right) Mr. Walter Humphreys of Barrie Ontario, Canada, Mr. Everett Valentine of Harrisville, New York, and Mr. Edward Farrand of State College, Pennsylvania. All three of these men were chosen by voting by maple producers throughout the U. S. and Canada. They were chosen for their lifetime of work and support to the maple industry.

Although there was only two con-

testants for New York State Maple Queen the contest was close. Wanda Jo Bush, representing Lewis County was crowned New York State Maple Queen. Wanda is the daughter of Mr. and Mrs. Richard P. Bush of Lowville, New York. The alternate New York State Maple Queen is Vicky Duck who represents St. Lawrence County Maple Producers. Vicky is on the left and Wanda Jo is on the right in the above photo.

COMING EVENTS

NEW YORK MAPLE TOUR:

This year's tour will be held in Delaware and Otsego Counties on Monday and Tuesday, August 9 and 10, 1982. Registration and assembly will take place from 11:00 a.m. to 12 noon at the farm of Bert Jump, RD 2, Bainbridge, N. Y. 13733. From Bainbridge go about 5 miles east on N. Y. Route 206, then turn right, 2 miles south on County Route 20.

Stops at 6 maple operations will include all types of evaporators from small wood fired units to large outfits using commerical or waste oil and one Vapor Compression unit. Dinner and the evening program will be at the Holiday Inn, Oneonta, N. Y.

Pre-registration is essential. A fee of $10.00 for adults and $5.00 for children under 10 years of age will cover the evening meal, refreshment breaks and tour materials.

For registrations or more information, write to Thomas Donelly, Cooperative Extension Agent, Box 184, Hamden, N. Y. 13782.

VERMONT MAPLERAMA:

This year the Vermont Maplerama will be held on August 6 and 7, 1982 in Lamoille County at Johnson State College. A full schedule of events is being planned for you, including tours of sugarhouses and sugarbushes, along with the many exhibits, and an evening program. Please plan to join us for the fun and excitement.

For details contact: David Marvin, Chairman, Lamoille County Sugar Makers, 1-802-635-7483 or George Cook, Lamoille County Agricultural Extension Agent, 1-802-888-5556.

PA. MAPLE TOUR:

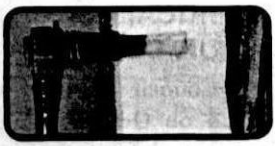
The 1982 Pennsylvania Maple Tour will take place in Somerset County on Friday and Saturday, September 17 and 18. For more information, call or write: Dale Jeffery, Salisbury, PA. 15558. Phone: 814-662-2904.

NORTH AMERICAN MAPLE SYRUP COUNCIL:

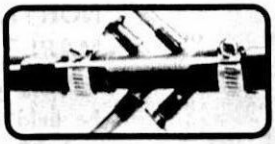
This year's Council meeting will be held in Ohio on October 25, 26 and 27. For more information, see Russ Davenport's column under editorials on page 5 of this issue.

Vacuum tubing system ...for maple sap gathering

the system which can **double** the **yield** of your sugar bush



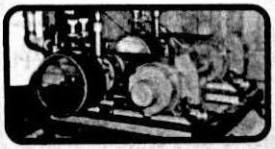
The sap is taken from the tree with use of a 5/16" threaded spigot. The sap then flows through 5/16" tubing to the main lines.



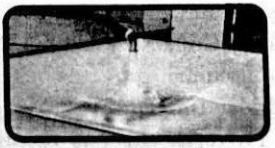
A double fork is used to connect the 5/16" secondary lines to the main line.

The main lines convey the sap to the sugar house.

In the sugar house, the sap flows into a vacuum release tank, which is connected to a pressure regulating tank.



Vacuum pumps are used to create a suction in the release tank. This vacuum action causes the sap to flow through the tubing to the sugar house at increased flow.



A float device either electronic or mechanical is needed inside the release tank to determine when it is full. The sap is then transferred into a large reservoir for storage, until fed into the evaporator.

Exclusive features

New threaded spigot, equipped with grooves at the intake, serves to draw the sap from the new growth layers of the tree. As a result of numerous tests conducted at our experimental sugar bush, we have determined that spigots with grooves at the intake will increase flow rate by 20 to 30% over ungrooved spigots.

New spigot cap, threaded to fit the spigot. After sap flow ceases, this completely closes off the spigot, allowing the system to be easily cleaned and flushed in the bush.

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A most important point is that the **IPL** specialist estimates **at no cost** the needs of each sugar bush. In order to insure maximum production, our company provides **free of charge** an expert team to assist the producer in the initial installation of the system.

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Wisconsin Honors Adin Reynolds

For most of his 76 years, late March has found Adin Reynolds tapping the sap of his maple trees near Aniwa. But on March 30 this year Reynolds will have to take a break during his busy season. The College of Agricultural and Life Sciences, University of Wisconsin-Madison is honoring him for his contributions as a family man, community leader, businessman, innovator and promoter of the maple syrup industry.

Adin Reynolds, warmly regarded here and internationally as Mr. Maple, and four other Wisconsinites will be recognized for their contributions to rural life, agriculture and the environment at the college's 73rd Honorary Recognition Banquet at 6:30 p. m. in the Great Hall of the Memorial Union.

Following an early life as a logger, dairy farmer, mail carrier and postmaster of Aniwa, Reynolds entered the maple syrup business full time in 1951. He expanded the number of taps from 2,000 in 1945 to 100,000 from the early 1950s to the early 1960s. He soon built Reynolds Sugar Bush into the largest maple syrup operation in the world.

In 1979, Reynolds stepped down and his oldest son, Juan, became president of the company.

Reynolds diversified the business and stimulated interest in maple syrup production by becoming a wholesale distributor of maple equipment, by developing an outlet store and maple gift shop, by hosting the annual Wisconsin Maple Festival and Pancake Day at Aniwa each May and by representing the Wisconsin Maple Syrup Producers Council at the State Fair.

Over the years Reynolds has been an innovator in his industry. He developed, tested and patented the plastic bag sap collector. Working closely with the Wisconsin Department of

Agriculture, Trade and Consumer Protection, he has developed new maple syrup products and packaging ideas to promote them. Reynolds has cooperated with researchers to develop and test alternate ways to concentrate the sugar content of sap before boiling, thus reducing the energy consumed to make maple syrup.

Together with UW-Extension and the Wisconsin Department of Agriculture, Adin Reynolds and his family have promoted maple syrup as a source of supplementary income, and have provided technical and marketing assistance to maple producers – thus helping hundreds of families.

"Adin Reynolds supported the UW-Extension's annual maple syrup institutes each January by exhibiting new maple syrup equipment at five to ten locations around the state," says UW-Extension forester Gordon Cunningham. Producers were attracted by the display, but Adin never recovered the cost of hauling the display across Wisconsin for five days and nights. He also took this time to report to local producers on national and international maple syrup developments.

Reynolds has been active at the community, county, state, national and international levels. He continues his long service to the Wisconsin Maple Syrup Producers Council by serving as secretary-treasurer. Reynolds is a director and past president of the North American Maple Syrup Council and the first U. S. chairman and now director, of the International Maple Syrup Institute.

In 1975 he was awarded the twin honors of Citizen of the Year by the Antigo Area Chamber of Commerce, and Outstanding Member by the Wisconsin Maple Syrup Producers Council. In 1979, Reynolds was inducted into the American Maple Museum's Hall of Fame at Beaver Falls, New York.

Adin Reynolds and his wife,

Geraldine, will celebrate their 55th wedding anniversary this year. They have two sons, Juan and Lynn, a daughter, Kathleen, eight grandchildren and four great grandchildren. Each year the family gathers during the spring maple festival.

Adin and Geraldine Reynolds are active members of the United Methodist Church of Aniwa. Mrs. Reynolds has been a 4-H leader and an Extension Homemaker. She has received the County 4-H Leader Award and the Extension Homemaker's Award.

Juan Reynolds was the moving force behind the retail maple syrup store and now runs Reynolds Sugar Bush with his wife Loretta. Lynn Reynolds formerly helped to promote new maple syrup processing methods. Now he and his wife, Anne, live near Hortonville where they are part-time farmers. Kathleen (Mrs. Leroy Sipes) lives in Columbus, Ohio, where she is an office manager for a chain of restaurants.

Others being honored March 30 are Vincent Drendel, Evansville, Keith Hawks, Green Bay, Eugene Meyer, Fort Atkinson, and Vernon Schultz, Manitowoc. More than 300 persons have been cited by the college since its first Honorary Recognition Banquet in 1909.

Using Wood Fuels Efficiently

by
Lawrence D. Garrett
Forest Economist, USDA
Forest Service, Flagstaff, Ariz.

Introduction:

The rising price of fuel oil has prompted many maple syrup makers to switch from oil to wood. Many operators will reduce their fuel costs by making this change, but some will not. Wood is cheaper than oil per unit of gross heat value, but it is not always burned efficiently. Because wood requires more labor for handling and firing, good evaporator efficiency must be maintained to minimize wood fuel costs.

Evaluating Wood Evaporators:

To determine how best to use wood fuels, we studied three commercial maple syrup operations (A, B, and C). The evaporators were of commercial size (5 or 6 x 16 feet), in a good state of repair, and installed to manufacturer's specifications with no modifications.

Four types of wood fuel were tested in each evaporator. In each fuel type at least 80 percent of the total weight was beech, birch, and maple.

1. Split or round hardwood being used by the operator during this study. The average moisture content, wet basis (MC), was less than 25%.
2. Split or round hardwood with average MC less than 30%.
3. Split or round hardwood with rot accounting for at least 50% of total volume. The average MC was less than 35%.
4. Split or round hardwood with average MC greater than 35%.

We made 12 tests with the three evaporators. Over 7,000 pounds of wood was burned in each test, which

lasted approximately 5 hours.

We studied all factors affecting the evaporator's thermal efficiency and operating effectiveness. These included: sap and syrup temperature; sap and syrup Brix; sap and syrup flow rates; stack, firebox, and air temperatures; weight of fuel consumed; wood moisture; barometric pressure; stack gas composition; and time required for opening and closing firebox doors.

What we found:

Our studies of oil-fired evaporators have revealed that they operate at a thermal efficiency between 65 and 75 percent. From 14 to 20 percent of the direct heat input is lost to gases going up the stack (fig. 1). An additional 7% is lost from poor hydrogen combustion in the firebox (Garrett et al. 1977). It is realistic to assume that similar evaporators using solid wood fuel would be less efficient because of the less favorable burning characteristics of wood and its higher moisture content.

Wood moisture is a critical factor in wood-fired evaporator efficiency. For each of the three operators studied, efficiency dropped significantly when the wood fuel used was changed from dry (20% MC) to wet (35-40% MC) (Table 1). For the three operators, the average efficiency was 52.8% when wood fuels with an average MC of 21.9% were used. With wood of 40.3% MC, evaporator efficiency dropped to 27.7% (Garrett 1981).

Fuel type 3 was in the study because producers remove deteriorated wood from their sugarbushes for use as fuel. It can be concluded from this study that the MC of deteriorated wood is much more critical for evaporator efficiency than the soundness of the wood.

In addition to the effect of higher MC on evaporator efficiency, an equipment effect is also important. The continual opening of evaporator doors introduces cold draft air, which creates a buffer of cold air that cools the undersides of the pans. Also, the cold air mixes with hot gases to produce a lower average gas temperature, further reducing net heat transfer.

The best method for firing a solid wood-fired, open-pan evaporator is to open one fire door at a time. By firing one-half of the burning surface at a time, the operator can maintain an effective fire in the evaporator with minimal door opening time and improve its efficiency.

Wood Fuel Economics:

The type of wood burned by maple producers has little other use except as pulpwood. It consists of stems and tops of cull, small-diameter, rough and rotten, and dead standing timber, and upper stems and tops of sawtimber. It

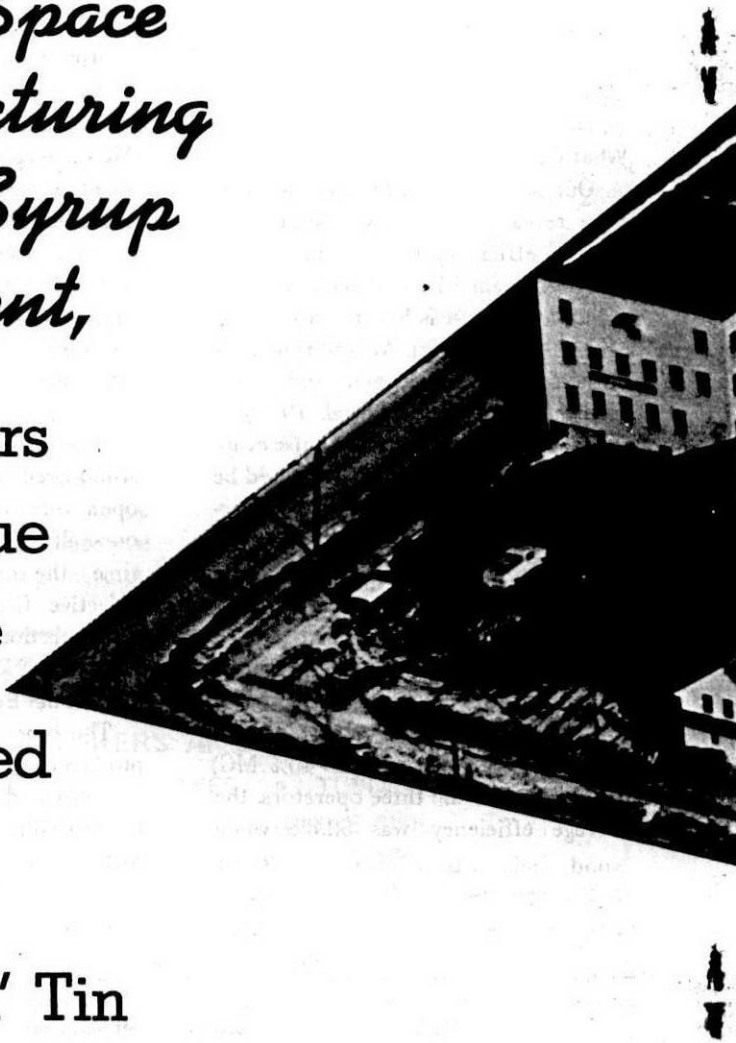
Table 1. Relative thermal efficiencies using solid wood fuels in maple syrup evaporators, in percent.

	Evaporator efficiency using:				
Operator	Dry hardwood MC 25%	Partially dry hardwood MC 30%	Deteriorated wet hardwood MC 35%	Green hardwood MC 35%	Average efficiency
A	66.3	45.4	38.2	30.4	45.1
B	49.5	43.6	32.5	28.4	38.5
C	42.7	33.2	32.1	24.4	33.1
Average efficiency	52.8	40.7	34.3	27.7	38.9

Cont'd on page 22

Our Factory

Ample Space Manufacturing Maple Syrup Equipment,



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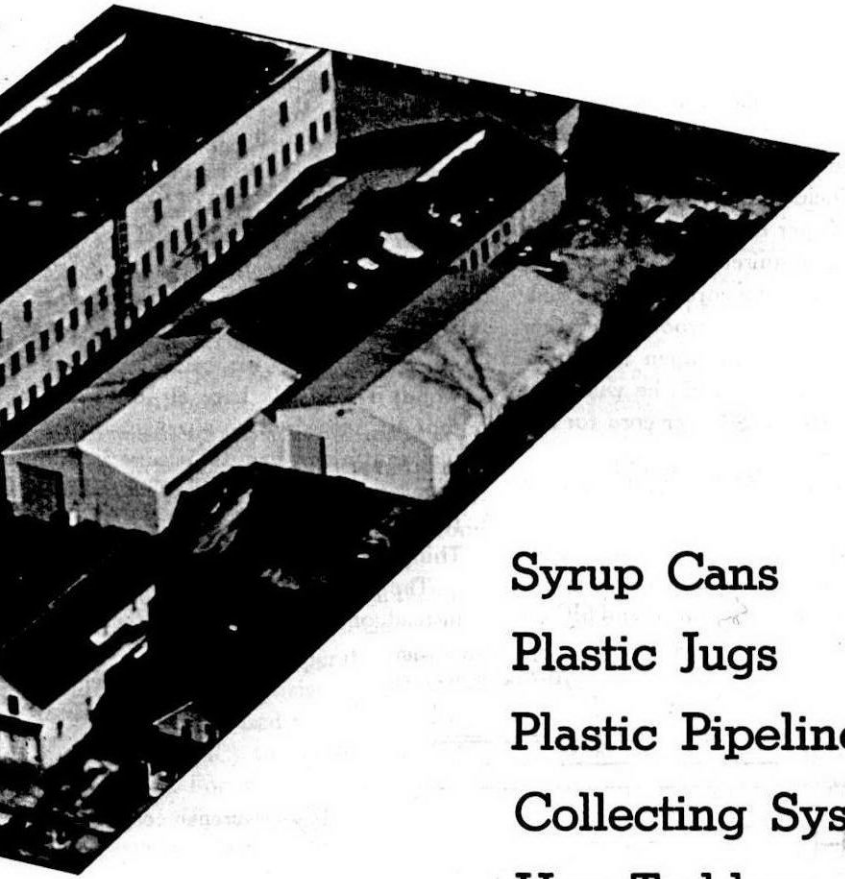

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Cont'd from page 19
usually represents cleanings from the producer's sugarbush and tops and culls from logging and timber stand improvement operations.

Generally, fuelwood is cut by the maple producer from his own woodlot (Kearl 1970, Morrow 1959). He must assign costs to his procurement activities to derive a real cost of the wood fuel. Normally he will incur out-of-pocket costs between $20 and $30 for each cord obtained (Frick 1978). If labor is included, the cost is between $3 and $5 per hour and 3 to 5 hours per cord is required. In our example, the total price of a cord would be $34. If the producer buys wood from other producers or on the open market in maple-producing regions, he will incur a cost of $60 to $80 per cord for air-dried wood.

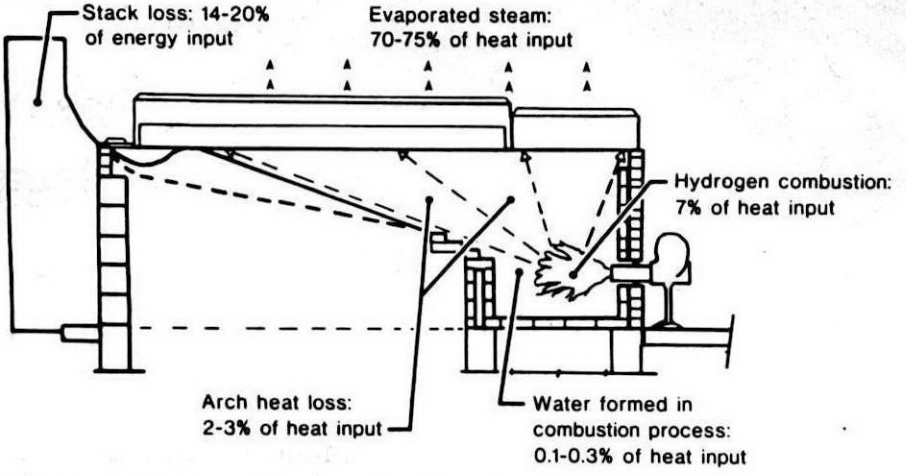
The price of $34 to $80 per cord does not necessarily reflect the value of energy received. If the maple producer ignores the effect of wood volume, species differences, and MC on realized net heat yield from wood, he could be paying a much higher price for fuel than he realizes. In general, the smaller, longer and more crooked the material, the lower the cubic-foot volume received, and the higher the real energy cost.

Also, the type of wood and its density directly affect its cost. If beech and eastern hemlock each cost $60 a cord, the comparative cost of hemlock is actually $96 because 1.6 cords of hemlock are required to equal the heat yield of 1 cord of beech.

Moisture content of fuel is very important in determining actual energy cost. Typically, green sapwood of northern hardwoods contains ½ to ¾ pound of water for each pound of wood; it is said to have 30 to 40 percent MC measured on a wet basis. Wet fuel can increase costs because it will only evaporate one-third as much water as the same volume of dry fuel.

Things to remember;

The operator who chooses wood instead of oil or gas must deal with



Evaporator efficiency = 100 - [16 + 2.5 + 7.0 + 0.2]
= 100 - 25.7
= 74.3

Fig. 1. Schematic of conventional oil-fired open-pan evaporator, showing efficiency losses.

several factors that contribute to its efficiency and the economics of using wood in a conventional evaporator. First, he must remember that when buying wood on a volume basis, such as by cord measure, less volume of a denser wood is required for the same heat value. Second, if the operator keeps his evaporator in good repair and uses good firing techniques, he still must be concerned with the MC of the wood he is using. Wood should be cut in the spring, split, covered, and allowed to dry for use the following spring.

Using dry dense hardwoods with proper operating procedures can ensure significant reductions in fuel costs over oil or gas. And wood is expected to maintain its economic advantage over alternate fuels for an investment period of 5 to 10 years.

Literature cited:

Frick, George P. 1978. The firewood producers manual. Sunderland, MA: Berkshire-Franklin RC&D Area, Inc., Div. For. and Parks.

Garrett, Lawrence D., Howard Duchacek, Mariafranca Morselli, Frederick M. Laing, Neil K. Huyler, and James W. Marvin, 1977. Increasing the efficiency of maple sap evaporators with heat exchangers. USDA For. Serv. Res. Pap. NE-388.

Garrett, Lawrence D. 1981. Efficiency of using solid wood fuels in maple syrup evaporators. USDA For. Serv. Res. Pap. NE-486.

Kearl, C. D. 1970. An economic study of maple sap and syrup production in New York State, 1969. Cornell Univ. Agric. Exp. Stn. Bull. 314.

Morrow, Robert R. 1959. Hardwood fuel for boiling maple sap? Farm Res. 25 (4) : 2.

Footnote: 1. This research was undertaken while the author was forest economist at the George D. Aiken Sugar Maple Laboratory, Northeastern Forest Experiment Station , Burlington, Vermont.

J. W. MARVIN AWARD

The 1982 J. W. Marvin Maple Research Award has been received "ex-equo" by two seniors who pursued in 1981-1982 an independent study in the UVM Maple Research Laboratory under the advising of Dr. Mariafranca Morselli and the staff.

The students were: **Antoinette James,** Resource Economics major in the School of Natural Resources, with the project: "Relationship of sap flow to some weather parameters." **Karen Tupper-Butcher,** Chemistry major in the College of Arts and Sciences, with the project: "Separation of phenolic compounds in sugar maple xylem sap and their identification by High Performance Liquid Chromatography."

The award of $100 was given to each student by Sam Cutting, Chairman of the Vermont Maple Industry Council, representing also the other donor, The Vermont Sugar Makers Association.

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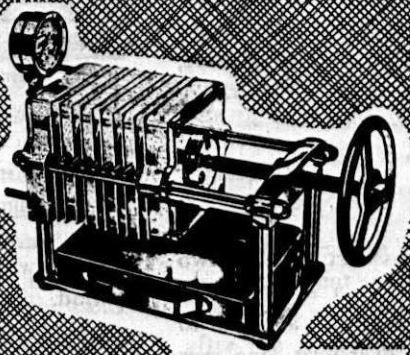

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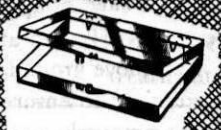

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Conifer Understory Removal Benefits Maple Sugarbush

by
Russell S. Walters
Research Forester
Northeastern Forest Exp. Station
Burlington, VT 05401

Do conifers in the understory of a maple sugarbush influence sap flow and sap-sugar content? After removing a heavy conifer understory from a northwestern Vermont sugarbush we found that syrup production increased and that accessibility and working conditions improved. This summary provides the highlights of the study. For a detailed account see Walters, R. S., 1978: Coniferous Understory Influences Sugar Maple (Acer saccharum Marsh.) Sap Production. USDA Forest Service Research Paper NE-398.

What we did:

This study was installed on two adjacent portions of a sugarbush in northwestern Vermont. In addition to the sugar maple overstory, one area was heavily populated with a mixture of eastern hemlock and eastern white pine conifers in the understory. A few of the pines and hemlocks were tall enough to reach into the overstory. This is referred to as the "cut sugarbush" (Fig. 1). The other portion contained an open, park-like sugar maple stand with no conifers, and is referred to as the "open sugarbush" (Fig. 2).

Before the conifers were removed, maple trees in both sugarbushes were tapped. Sap was collected for a 3-year calibration period to determine average annual sap-volume yields and sap-sugar percentage for each tree. After the 3-year period, 56 sugar maple trees were selected for study–28 of the highest yielding trees in the open sugarbush and 28 of the highest yielding trees in the cut area. The selected trees ranged in dbh from 12 to 33 inches.

Figure 1. The cut sugarbush before the conifers were removed.

Following the 3-year calibration period, all white pine and hemlock stems 1 inch in diameter and larger were cut and removed from the cut sugarbush area (Fig. 3). An average of 525 stems per acre were cut.

Each year, standard-size tapholes (7/16 inches in diameter) were drilled into the southern side of each sample tree to a wood depth of 3 inches at approximately 4.5 feet above ground. Extreme care was exercised to ensure that all tapholes were as nearly uniform in dimension as possible.

The sap from individual tapholes was collected in separate covered containers and measured to determine the total season yield and the average sap-sugar percentage for each study tree. This was done each year during the calibration period and also during

Figure 2. The open sugarbush area.

nine sugaring seasons following the removal of the conifer understory. Annual syrup-equivalent yield was computed for each tree from the sap-volume and sap-sugar data. Syrup equivalent yield is the amount of syrup that could have been produced from the sap collected; it is a useful measure of the performance of a tree. The data were statistically analyzed using the yield data for the open sugarbush as controls to indicate the magnitude of influence exerted on sap flow by the weather conditions in each season.

Growth response to the understory removal treatment was assessed by examining increment cores from a sample of 16 trees. Radial growth for the 9-year period before treatment and for the 9-year period after treatment was measured in each portion of the sugarbush.

Results:

During the three sap seasons of the calibration period and in the 3 years that followed, an average of 14 percent less sap was collected from the trees in the cut sugarbush than from those in the open sugarbush. By the 6th year after treatment, sap yield from the trees in the cut sugarbush had increased until it was slightly greater than from the open sugarbush. Sap yield and syrup-equivalent yield generally followed the same trend. In 9 of the 11 sap seasons observed, the sugarbush yielding the most sap per taphole also yielded the largest syrup equivalent per taphole.

Removing the understory stimulated tree radial growth. Before treatment, trees in the cut sugarbush grew slower than those in the open sugarbush, but after the treatment they grew faster. This increase was visible in the width of the growth ring that formed 2 to 3 years after release.

Discussion:

I believe removing the coniferous understory made available more moisture, nutrients, and growing space. The response in growth rate to the release treatment shows that physiological activity in the trees increased. Fast-growing, vigorous trees are known to produce more sap and total sugar (Blum 1973).

Before the understory removal, there was less daily variation in air temperatures and the temperature rose more gradually during the day within

Figure 3. A portion of the cut sugarbush area after the conifers were removed.

the closed sugarbush. The flow mechanism of maple sap is known to be extraordinarily sensitive to temperature changes, and a 2° or 3° rise often is enough to initiate a good flow. After the understory removal, the trees warmed faster, triggering sap flows earlier in the day, and perhaps on more days.

In sugar maple trees, the reserve carbohydrates that are converted to sugar are stored in specialized "ray cells." During sap-flow periods, sugar moves from the ray cells into the vessels. It is conceivable that the contact between ray cells and vessels would be greater if the ray cell population were increased. This, in turn, could increase both sap flow and sugar release, increasing sugar production but not necessarily higher sugar concentrations. The number of ray cells increases when the tree's growth rate increases (Gregory 1977).

This hypothesis explains the increased sugar production we observed in this study, because we also observed the increase in growth rate. It also helps explain the time lag before the increased sap production became evident. If a change in growth rate causes a change in the number of ray cells which, in turn, influences sap and sugar production, several years would be required before enough wood could be produced to establish new sap-flow characteristics. We did not detect an increase in yield from the treated area until 5 or 6 years after the understory was removed.

Conclusion:

We found that the coniferous understory in this sugarbush inhibited syrup-equivalent production and tree growth. Removing it increased sugar production after a lag of several years, and improved accessibility and working conditions in the sugarbush. We recommended removing any coniferous understory from sugarbushes.

References: Blum, Barton M. 1973. Relation of sap and sugar yields to physical characteristics of sugar maple trees. For. Sci. 19 (3) : 175-179.

Gregory, R. A. 1977. Cambial activity and ray cell abundance in Acer saccharum. Can. J. Bot. 55(20):2559-2564.

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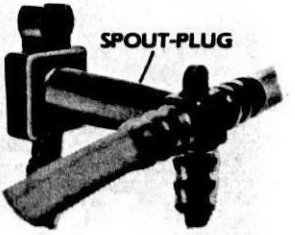

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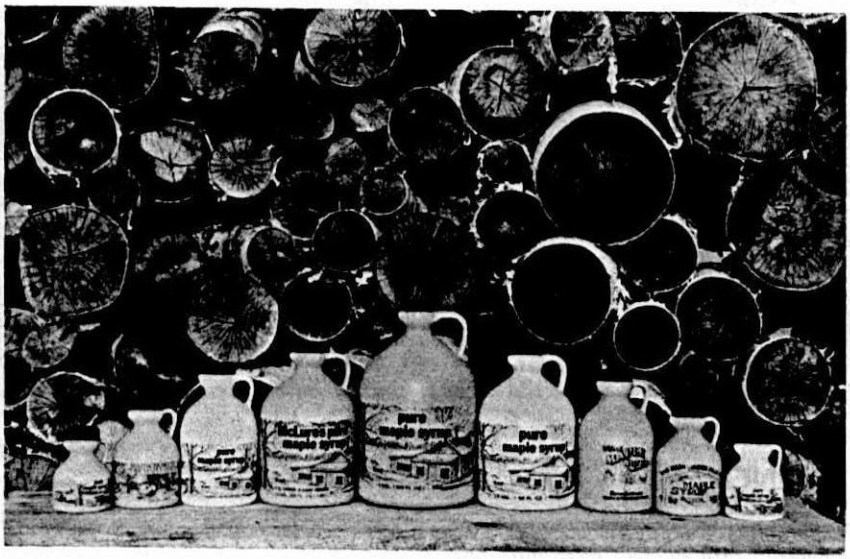

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Uihlein Family Gives Land To Cornell

by
David L Stewart

New York State, the second largest producer of maple syrup in the nation, has more than 1,000 commercial and even more non-commercial producers. Annual production is valued in excess of $6 million.

Leading the way in research on maple syrup and sugar bush management is the New York State College of Agriculture and Life Sciences at Cornell University, which has operated an experimental center here since 1965.

Known as the Uihlein-Cornell Experimental Sugar Bush, research at the facility has benefitted the maple industry not only in New York, but in other states as well. It is named in honor of Henry H. and Mildred A. Uihlein, longtime supporters of agricultural research at Cornell.

Now, additional research and demonstration projects will be possible with the gift of two tracts of land by the Uihlein family. More than 205 acres of land in the Town of North Elba, Essex County, have been deeded to the University. This land adjoins another major research facility operated by Cornell for the benefit of New York State's potato industry, the Henry Uihlein II Laboratory, and the Uihlein Farm of Cornell University, both at Lake Placid.

Cornell officials say they are pleased that the gift of these valuable parcels will allow this unique program to be continued at Lake Placid.

One parcel, 8.15 acres in size, is at the intersection of Old Military Road and Old John Brown Road, and the second, on the west side of Bear Cub Road, covers 197 acres. The long-term availability of these maple woodlands is considered vital to the continuation of Cornell's sugar maple research and education program.

As part of a long-term study (20 to 30 years) with the USDA Forest Service Lab in Burlington, Vermont, Cornell researchers will use the 8.15 acre parcel for studies of the planting and early growth of sweet tree (maple) stock of superior genetic strains. Among other attributes, the maples to be planted at the Lake Placid site are capable of producing more sap than regular trees.

The other block of land comprises the primary producing area which had been leased to Cornell for many years. With ownership of the sugar bush, Cornell will expand many experiments, including one dealing with energy efficiency in vapor compression evaporators used to transform sap into syrup.

Robert R. Morrow, professor of forestry in the College of Agriculture and Life Sciences, who has directed the sugar bush project since its inception, estimates that it will be possible to produce maple syrup with about one-quarter to one-third of the current amount of energy required for the evaporation process.

Previous studies at the Uihlein-Cornell Experimental Sugar Bush have dealt with sap flow in tubing, leading to applied recommendations for field use, pipeline layout, sugar bush management, patterns of sap flow and

effects of weather, and the use of preheaters.

More than two dozen publications on maple research have resulted from research at the facility. Some of it has involved other agencies and facilities, including the Arnot Forest in the southern tier of the State, Miner Institute in Chazy, and the Northeast Forest Experiment Station of USDA at Burlington, Vermont.

Producers from N. Y., VT., and other maple syrup producing states, students from the College and other researchers visit the facility regularly to learn first-hand of the many improvements made in the maple syrup industry, such as permanently installed mainline piping systems, vacuum pumps, modern syrup packaging, maple product making, and marketing methods.

Cornell Cooperative Extension education programs for maple producers are conducted annually by Lewis J. Staats, manager of the sugar bush, and John Kelley, associate professor and leader of Cooperative Extension programs in the department of natural resources at Cornell.

David L. Call, dean of the College of Agriculture and Life Sciences at Cornell, explained that with good management of stock, and maintenance of soil conditions, one maple tree can produce for more than a century.

"This gift from the Uihlein family," he noted, "will make it possible for the University to continue sugar maple research and education programs as far into the future as I can see."

He concluded, "I am proud of the partnership between Cornell and the Uihleins in the furtherance of agricultural research for the State and nation."

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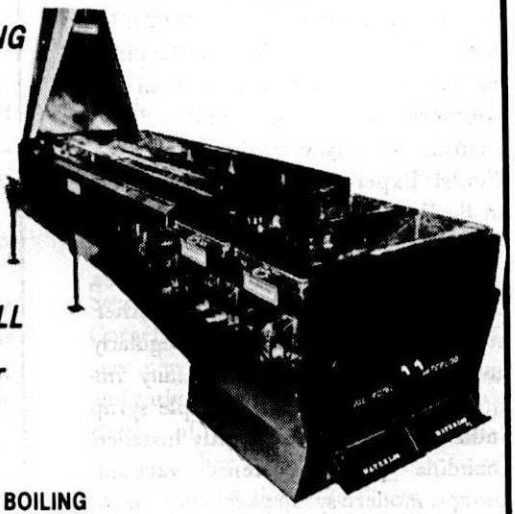

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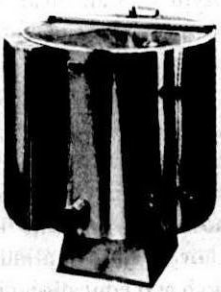

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Well, ya see it was like this. There was so much snow the gas and oil delivery truck couldn't get through. We needed something to run our engines. I knowd that by diluting syrup and adding raisins and yeast I could make maple wine, then by distilling the wine through our still we could make 150 proof alky. We ran the wood splitter and the tractor on what stuff we didn't drink.

Everything was going fine until the hired man, who imbibed too much of the stuff visited the local tavern. The local tavern keeper turned him in. The feds found out we didn't have a license to operate that still so they fined us $50. Good thing we didn't sell any.

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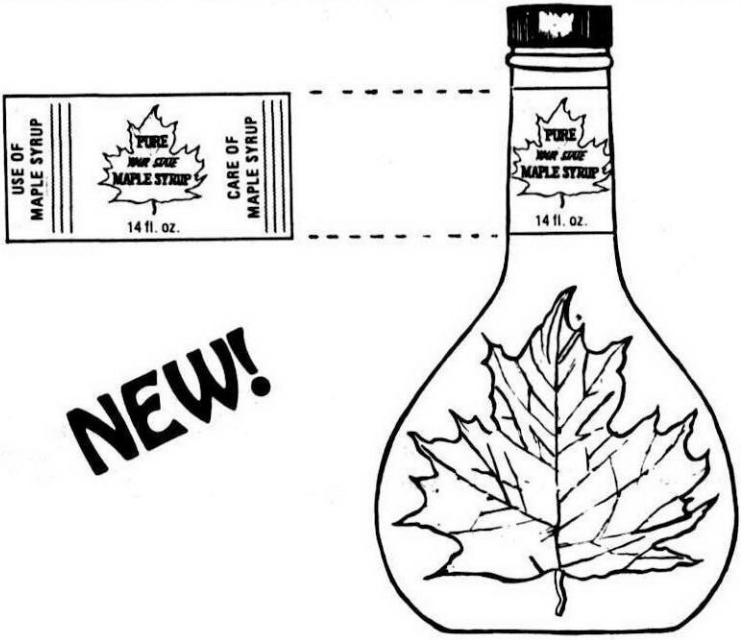

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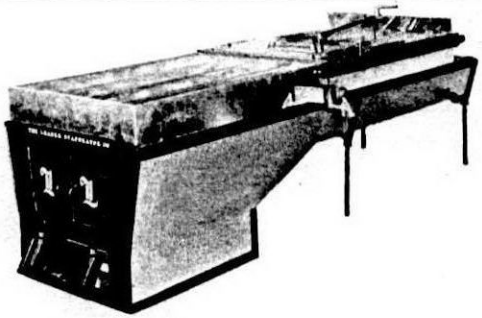

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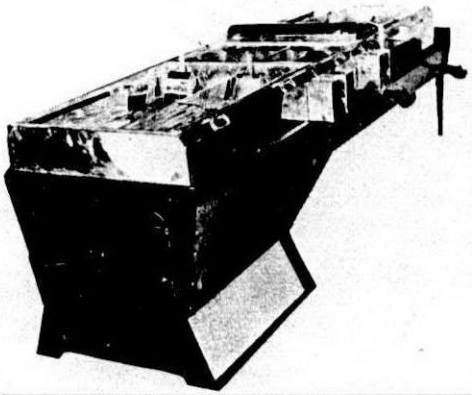

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