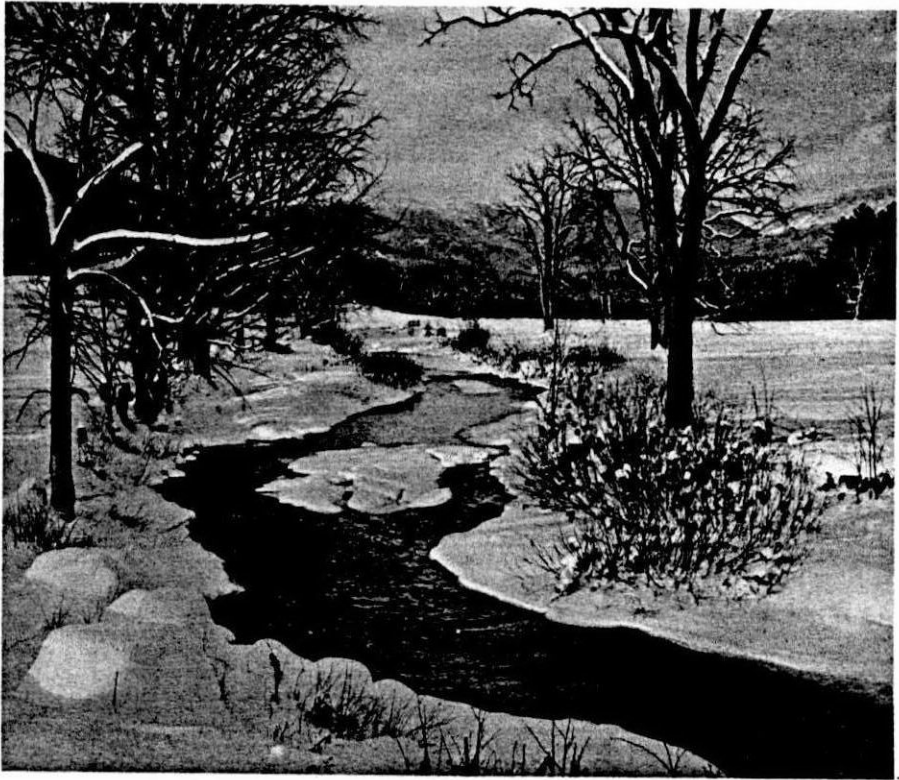


NATIONAL MAPLE SYRUP DIGEST NATIONAL



Vol. 18, No. 4

December 1978

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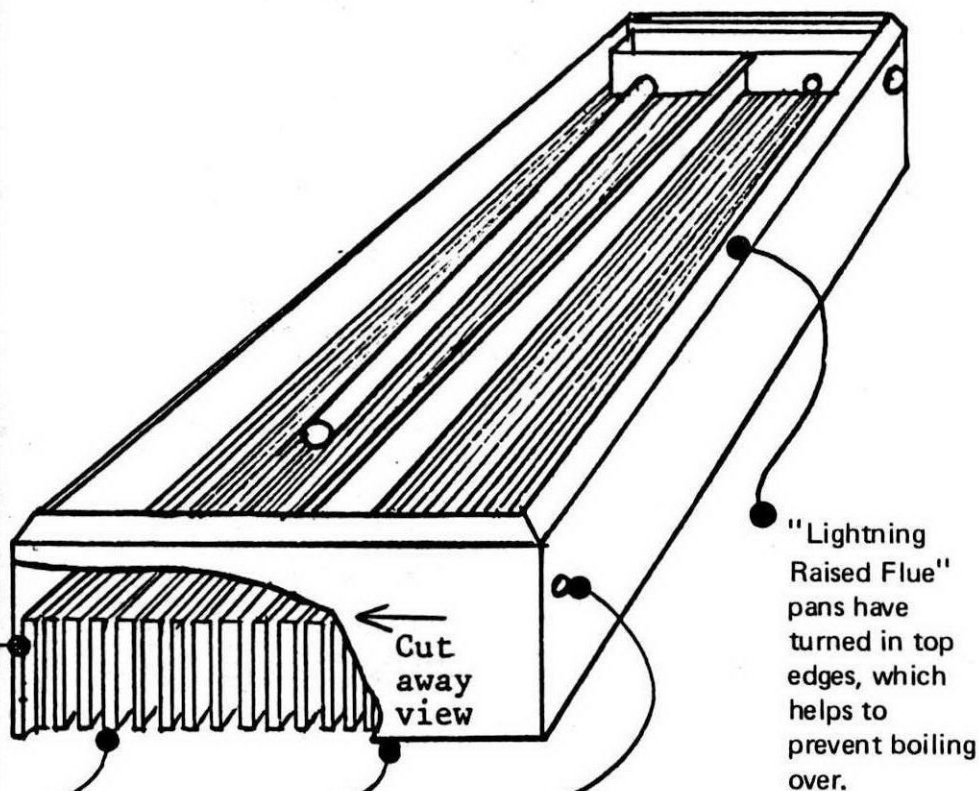
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Editorial

The 19th annual meeting of the North American Maple Syrup Council, a joint meeting with the International Maple Syrup Institute, was held on October 16, 17 & 18 at the Inn at the Peak, Clymer, N. Y. Again, the Council kept its record with perfect attendance, every member state and province was officially represented. Nineteen years of perfect attendance is quite a record.

The first day was entirely devoted to Council Business. One of the main topics was financial support of the Digest. Briefly, the expenses of the Digest was not much more than the previous year which is surprising when all costs are increasing so much. The receipts were a little better than a year ago which left the Digest with a smaller deficit amounting to a little over \$900.00. The Council voted to pay this and not bill the state associations as before.

The Council directors recommended the following changes be made to try to put the Digest in the black:

1. Advertising rates be increased 20%.
2. Yearly subscription fees paid by the associations be increased from \$1.00 to \$2.00 per member.
3. The Digest is to recommend a contribution rate of at least \$2.00 per year (which was done last year) and keep a good record of contributions (which has been done for 15 years) because if this doesn't work, it will probably be necessary to resort to a strict subscription system and eliminate all who do not con-

tribute. The handwriting's on the wall, folks, but wait until the February issue. We'll include a self addressed envelope for your convenience.

Another item of importance is this: According to reports of production by the state delegates, the maple syrup crop ranged from fair to better than normal with the total amounting to about an average crop for the whole area, but there's very little left for sales this fall, especially for Christmas.

This means there isn't enough produced and much is sold at too low a price. Bulk syrup is so scarce the price has skyrocketed this fall to .95 to 1.30 per pound. This is more than a lot of producers charge in a can (you ought'a kick yourself for being stupid). The I. M. S. I. is pushing for more production (more about that latter) and the research stations are working on everything from producing more and better sap to more and better markets (see Vermont Maple Industry Council report in this issue).

IMPORTANT NOTICES

- Again, there's no Women's page in this issue. Why? No contributions. Mary Lou says she can't print it unless you send it.
- Quite often we receive a letter from a reader who says his association pays for his subscription fee when the fact is - that association does not contribute. This means the association tells their members something but doesn't follow through. One association claimed to support the Digest for several years and last year was the first time they ever sent it in. Better check up.
- Association Secretaries: When you send your membership lists, be sure to list the names of those who do

THE ADAMS

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*Season's
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not receive the Digest, the deletions and address changes all separately. Sending one list of the complete membership makes me an awfully lot of work. To make your job easier, put a question on your membership card asking: Do you receive the Digest? Yes or No.

- We absolutely must have zip codes.
- And, last but not least: The Digest has a new phone number: 607-967-8331. It's the same as my business number because that's the only office I have (part of my wifes kitchen).

It wasn't my idea to change it. The phone company changed a bunch of them here to accommodate some new high falutin' equipment they've installed to "improve" the service. If they improve it once more, we won't even be able to get a dial tone! It was so messed up for about a week, we received several letters asking if we had gone out of business or why we didn't answer our phone. When folks have to resort to the U. S. Mail to communicate - - things just couldn't be worse.

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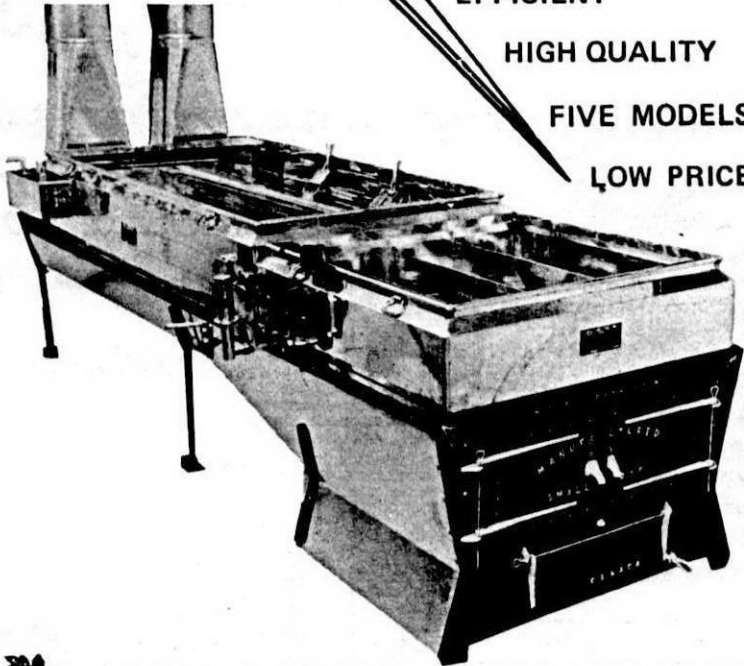
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In order to gather these ideas, tricks and devices which could improve productivity, profitability, sap yield, quality or any other dimensions of maple bush management, the Institute is running a contest among all maple producers of North America.

Participants could enter by writing their idea(s) on how they did or they wish to improve the productivity of their operation on 8½" x 11" paper with or without illustrations. Entries will be judged by a jury of four specialists in maple syrup production. The selection of the winning entries will take in consideration: the originality of the idea, its practicability and its possible application in a large number of maple bushes. The neat designs and typing of the entries will not be of any consideration. Participants could submit as many entries as they wish.

All entries must be in by February 28, 1979 and automatically become the exclusive property of the International Maple Syrup Institute and

will not be returned. All copyrights are automatically yielded to the Institute.

Number of prizes will be awarded, namely:

- 2 grand prizes of \$1,000 each
- 5 major prizes of \$500. each
- 15 runner-up prizes of \$100 each

All prizes must be accepted as awarded by the judges. The decisions of the judges are final and not subject to appeal.

This contest is subject to all relevant laws and is open to any individual with the exception of members of the executive committee of the Institute and members of the jury.

Entries should be mailed to:

International Maple Syrup Institute
P. O. Box 220

Montreal, Quebec H3Z 2T2

and should be accompanied by a SIGNED note reading "I hereby acknowledge that I have familiarized myself with the rules and regulations of the contest, accept them, and agree to be governed by them"

For further information please contact:

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The directors of the American Maple Museum would like to invite every maple producer to vote for their choice of candidates for induction into the Hall of Fame. We will induct two people into the Hall of Fame this year so each maple producer should select two names. Please write clearly your choices and give a brief history of them including their contributions to the maple

industry. They may be living or deceased. The two who receive the most votes will be inducted into the Hall of Fame on opening day.

Please take a few minutes and send in your choices right away. All votes must be received before March 10, 1979. Send them to: American Maple Museum, Box 47, Beaver Falls, N. Y. 13305.



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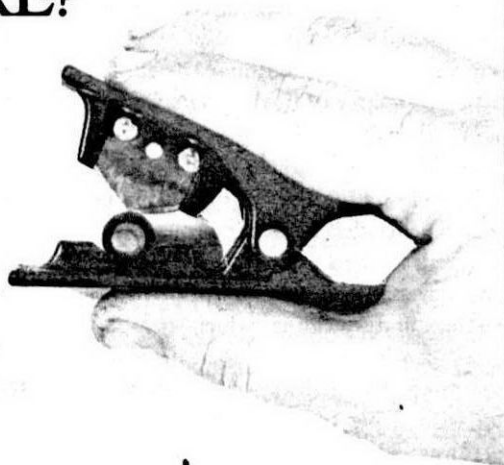
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LETTERS:

ARCHIE'S SUGARBUSH

Dear Editor,

My wife, she sez, "Truthful Archie, sometimes she calls me Honest Archie, Tell that nice Mr. Editor about the big slip above the Sugar House the spring after the winter of the blue snow."

Well, it rained for 40 days and 40 nites. The bush above the blacktop was really saturated. The mornin in March I decided to tap the trees I discovered all the trees slid down the hill and covered half the blacktop. While resting and deciding which way to work the bush, up the road or down the road, the highway crews showed up with 2 big bulldozers to clear the highway. The dozers started down the highway in echelon with the blades set at 45°. The trees slid off the pavement on the berm and were lined up like

soldiers at attention.

Now my son in the Army and is an inventor working on a rifle bullet which increased speed as it was fired. He was after me to try it out, so I sighted my 30-30 down that row of trees and pulled the trigger. The bullet went straight through all but the last sugar tree. I tapped spiles in the bullet holes on each side of the trees and hung all 4501 buckets in one afternoon, alone. The odd number was because the bullet did not go completely through the last tree in column. That tree only got 1 bucket.

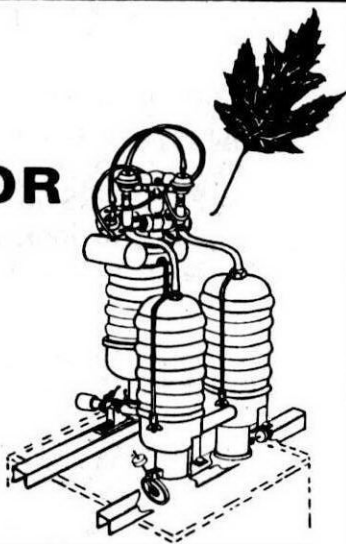
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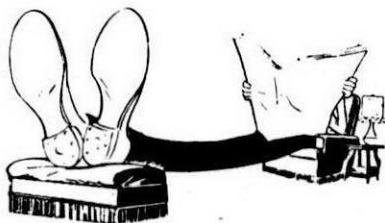
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BOB LAMB'S CORNER



We attended the first joint meeting of the North American Maple Syrup Council and the International Maple Syrup Institute. It was held at a very elaborate resort called the Inn at the Peak near Clymer, N. Y. It was one of those real fancy places that you should save a clean pair of overalls for.

The maple areas were well represented with a particularly large group from Quebec. The meeting was well organized and all subjects had alot of meat on the bone.

Russ Davenport from Massachusetts brought up the fact that many species of trees were dying off in certain areas. He believes there are many more diseases affecting our maple trees and taking their toll then we know about. He is right, but I suppose there is a limit on what can be done to help them. Russ hopes there can be more research to help our maple stands.

Gaston Allard, from the N. E. Forest Experiment Station, stated that they were still not convinced the tap hole pellet harmed the trees. Also, in vacuum pumping, 5" at the tap hole did not produce anywhere near as much sap as 10" of vacuum and 15" was slightly better.

Fred Laing, University of Vermont,

does not recommend the use of black plastic pipe for main lines. Black pipe is used less and less each year in the states, but the big trend away from it has been in Quebec. Fred has pushed this point for years.

The Quebec producers had a very costly education a few years back when their area was flooded with dark syrup. Since they are smart enough to produce 75% of the worlds syrup, they were smart enough to correct the situation real quick.

Alot of other things came up at the meeting which you'll soon hear about from other sources. My mind is pretty well programmed to the tubing business so I better stick to it and stay out of trouble.

All I can say now is: we have quite a few new items that we hope to have ready for this coming season. However, when our tool makers are building new molds, you just don't hold your breath long enough for them to be completed. I hope to have all the dope for you by the next issue.

Bob Lamb

VERMONT MAPLE INDUSTRY COUNCIL RESEARCH NEEDS

September 1978

REPORT OF THE COMMITTEE ON RESEARCH NEEDS

The recommendations of the Committee are attached. The areas of needed research are set forth as requiring short, mid-term, or long-term projects. This segregation is for planning purposes only and requires some explanation.

Many of the indicated areas are currently receiving research attention. But where a specific project is being pursued within a broader area of research the duration of that project is used and is not meant as a limitation on further research in that broad area if needed. The "New Product" area is an example in which specific products are being investigated and is shown as short-term. As new products become feasible more projects may be initiated. Current projects are included in the rec-

ommendations because they are incomplete, are worthy of study and therefore continued research support is required.

The committee found it necessary to address the following policy matters because of their potential impact on the role of research in the maple industry.

1. The presentation of research findings to the industry is an Extension responsibility. Due, in large part, to the rapid change in maple technology and economics it has not been possible for present Extension personnel to fulfill this task. The hard work and devotion of the Extension Forester, some County Agents and County Foresters, is recognized and commended. The fact that these people have other responsibilities is also recognized.

We strongly urge implementation

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of the 1975 Governor's Maple Industry Task Force recommendation that an Extension position be created for full-time work with the maple industry. The current move of the Vt. Dept. of Agriculture to assume a larger role in Extension work will be helpful. Coordination of all extension efforts is recommended.

2. The Governor's Task Force also recommended establishment of a service laboratory for testing maple products. The Vt. Dept. of Agriculture is now in the process of creating this facility.

We recommend that this facility be adequately staffed and that the advice and co-operation of the maple research groups be solicited.

3. Concern was also expressed by Committee members about the economic impact of land use policies and taxation on the maple industry. Also that a large scale move to wood energy technologies in the State might have economic implications on sugarbush values.

4. An area titled "Means of Increasing Production" received strong support from Council members. This is an area in which a solution cannot be reached by research alone. It does present a strong argument for additional Extension support.

We recommend the completion of standardized county surveys of maple resources including location and availability of idle sugarbushes. The County Surveys should be collated and made available to Extension offices, area resource and development specialists and the State Agency for Development and Community Affairs whose cooperation should be sought in all aspects of this work.

We further recommend an incentive program for new sugarmakers that might be initiated by the Vermont Sugarmakers Association at the State and County levels.

Attached are the research recommendations of the Committee.

Research Recommendations

Short Term (1-3 years)

1. Marketing research - consumer preferences, buying habits. *
2. Quality Control of Sap and Syrup
 - a) protection of sap in storage and transit †
 - b) more accurate methods, or instruments, for sap and syrup density and quality
 - c) effect of different microorganisms on sap and conditions conducive to each †
 - d) easy, accurate, qualitative test for buddy syrup

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- e) means of detecting adulteration *
- f) syrup containers - retail, plastic, tin, glass wholesale - sanitary lings (exopy or alternatives) *†

3. Sap and Syrup Production

- a) more energy - efficient, less costly vacuum pumps †
- b) feasibility of leaving pipeline systems in place between seasons, sanitation

4. New maple products *

Medium Term (3-5years)

- 1. New evaporator technology-modifications of traditional units and alternative systems *†
- 2. Alternate fuels for processing *†

Long Term (5 years or more)

- 1. Maple "decline" - see attached statement

2. Climatic Variables

- a) effect on, and within, the maple season *†
- b) more reliable weather prediction

3. Genetics - a basic study contributing towards the production of superior trees *

4. Physiology and Anatomy - basic studies including sap flow mechanism and anatomical features of superior trees *†

5. Chemistry of Syrup Processing - development of color and flavor and alternative methods for obtaining optimum development *

6. Silviculture - sugarbush management and study of site factors responsible for high yield trees: stand establishment practices *†

7. Cost Information - periodic updating of production and processing costs *

8. Economics - effects of land use policy and taxation on the maple industry

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FOOT NOTE:

Research areas currently being studied by the Aiken Sugar Maple Laboratory, U. S. Forest Service, are marked with an asterisk (*). Those being studied by the Proctor Maple Research Farm, Vt. Agric. Experiment Station are marked (†). Where a research area has both an (*) and a (†) they signify that a co-operative project is in force or that study is being made of different aspects in the same broad area. No duplication of effort exists.

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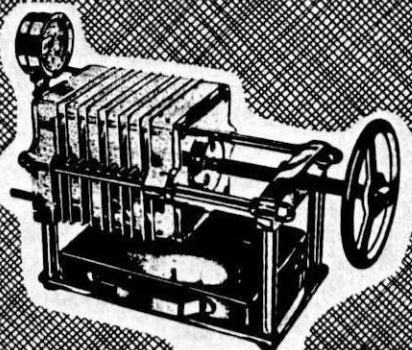
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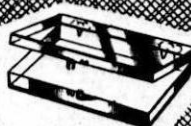


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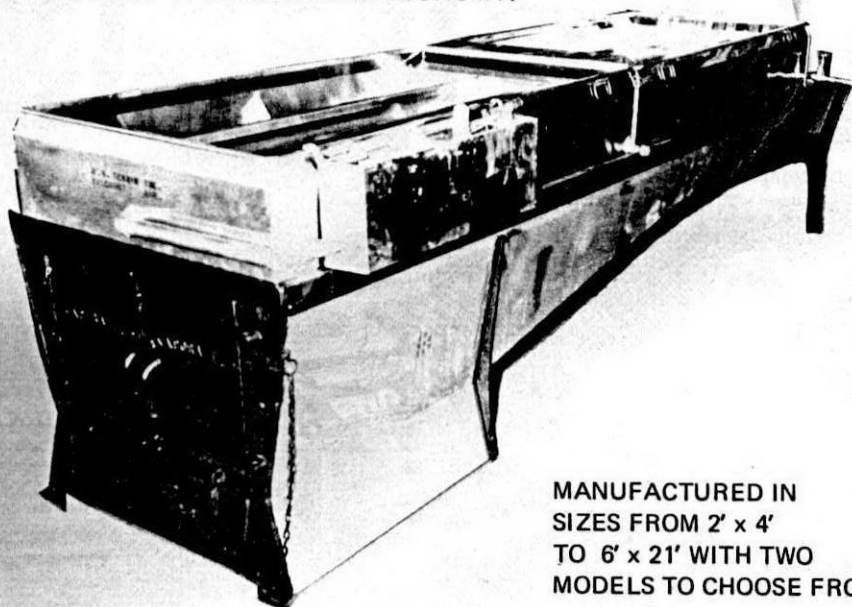
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"MAPLE POWER" NEWS BULLETIN FOR 1978

Thanks to all exhibitors and producers (over 200 total) who made the day a success for all attending the 3rd annual Tubing School. Next years will be bigger and better than ever with more exhibitors and tubing demonstrations during the day. The tubing school's food booth was manned by the members of the Hadley-Luzerne, N. Y. Lions Club, who wish to thank all producers/exhibitors for a successful day. Support your local Lions Club on its sight, hearing, Community Projects.

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MECHANICAL COMPRESSION EVAPORATORS

by
Lawrence D. Garrett
and
Mariafranca Morselli

INTRODUCTION

The economics of the single-effect open-pan maple syrup evaporator are marginal. Oil-fired evaporators, which are in predominant use, require 3 to 4 gallons of oil for each gallon of syrup produced. Their steam efficiency equivalent is 1.5:1; 1.5 pounds of steam energy equivalent is required to evaporate 1 pound of water.

In 1977, the cost of processing a gallon of syrup on an oil-fired open-pan evaporator was approximately \$3.60; 40 percent of which was for fuel alone. Fuel, labor, and miscellaneous direct costs amounted to 63 per-

cent of the total cost; only 37 percent was amortized capital cost, leaving little flexibility for realizing economies of scale with this technology.

Today there is no commercial maple operation in the United States or Canada producing syrup continuously by any method other than conventional open-pan evaporation. Yet, there are other methods of concentrating sap to a higher sugar content. These include flash evaporation, thermal evaporation under vacuum, mechanical compression evaporation, reverse osmosis, ultrafiltration, and freeze drying.

Mechanical compression has been used for desalinating salt water since World War II. We decided to investigate mechanical compression for the maple syrup products industry. To be viable it had to demonstrate both its economic effectiveness and its ability to produce a quality product.

We analyzed quality control and engineering data from initial tests made with a standard salt water vapor com-

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pression distiller (VCD).

VCD Prototype Operating Characteristics

The redesigned VCD system concentrates sap to syrup in two steps. The dilute sap solution entering the system is preheated in a heat exchanger that absorbs the heat from newly made distillate coming from the evaporation chamber. The feed is then introduced into a recirculation loop connected to the initial concentration chamber. Here a part of the liquid is vaporized when it comes in contact with the heating bundle, thus increasing the concentration of the solution. The syrup then passes by gravity to a second concentration chamber where it reaches the desired concentration. The concentrate is discharged from the system by a pump.

The water vapor generated from the two sections is combined and passes through a wire-mesh demister to remove any entrained droplets. The vapor is then compressed and piped through the heat tubes; the hot vapor is condensed by the cooler concentrate

on the outside of the tubes, thus giving up its latent heat of vaporization and most of the energy required to evaporate an equivalent amount of water from the sap solution.

Heat lost to the environment by radiation, convection, and incomplete heat exchange requires a small amount of heat to be continuously added to the system. This heat is provided by electric heaters located in a boiler that reboils small portion of the distillate. During normal operation, pressure switch on the shell cycles one heater on and off to maintain the needed amount of steam.

The evaporating efficiency of the vapor compression distiller is 21.0 when concentrating sap to a level of 66° Brix. Evaporating efficiency is not affected by changing the level of sap concentrate infeed. That is, a change of 1.5 to 3.0° Brix sap changes sap-to-syrup flow, but has an insignificant effect on distillate flow and Btu requirements.

The VCD prototype required only 0.047 pounds of steam equivalent per

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pound of distillate produced. This compares to 1.5 pounds of steam in a conventional maple syrup evaporator and 1.1 pounds in the most efficient single-effect boilers. Therefore, evaporation efficiency from vapor compression is 32 times that of the conventional open-pan evaporator.

Product Quality

Maple syrup produced from the re-designed VCD unit was judged good to excellent in flavor, and characteristic of a B-grade syrup. B syrups produced from the VCD unit were compared to a random sample of B syrups produced from a conventional evaporator using identical sap. The level of flavor precursors found in the sap precluded making a syrup of lighter color.

There are chemical differences between the syrups produced by the VCD and the open-pan evaporator but these differences do not indicate major differences in the product.

Economic Effectiveness

- Maple sap is high in unit weight but low in unit value.
- Maple sap is geographically dispersed so that transfer costs increase significantly as distance from tree to plant increase.
- The volume ratio of raw material (sap) to product (syrup) is 36 to 1. Consequently, costs are incurred for 97 percent of the resource volume (water) which is later discarded.
- The production period is limited

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to 8 to 12 weeks, only 15 to 20 percent of the available annual production period for many processed foods.

- Maple syrup processing requires considerable energy for water evaporation and development of color and flavor.
- The availability of maple sap in a plant's procurement zone can fluctuate as much as 30 percent from one year to another due to weather alone.

A vapor compression plant affords greater return on invested capital than the conventional maple syrup processing system,

Lack of space prohibits publishing this report in its entirety. If you are not thoroughly confused by now, and would like a copy of the entire paper complete tables of installation and operating costs and projected return on investment, write to North East Forest Experiment Station, Forest Service, USDA, 370 Reed Road, Broomall, Pa. 19008.

— Editor

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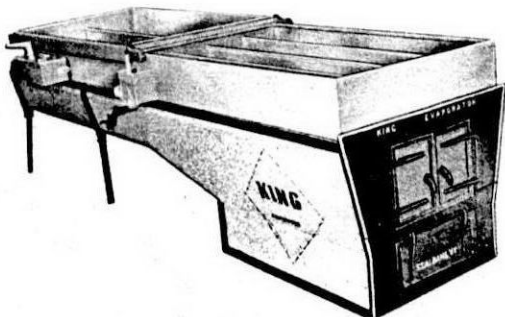
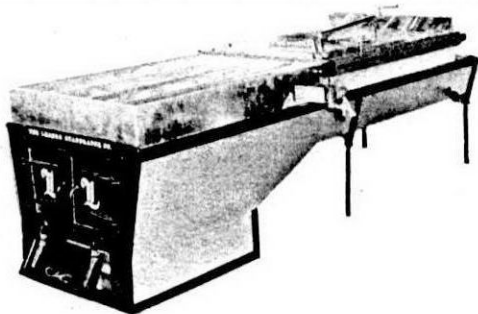


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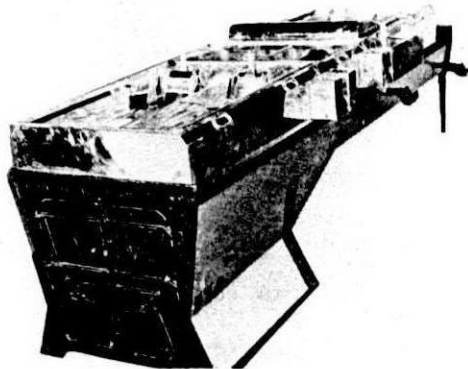
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