National Maple Syrup • DIGEST •

THERMOMETERS
and
HYDROMETERS
PACKAGING

Vol. 2, No. 1 BAINBRIDGE, NEW YORK JANUARY 1963

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Join Your Local Association NOW!

It is the duty of every maple producer to join his local Maple Producers' Association. This can be done at your local maple school or institute this winter. If you cannot attend your meeting and wish to join by mail, send your name to your state delegate as listed on page 2 of this issue or write to the MAPLE SYRUP DIGEST, Bainbridge, N.Y. and we will forward your letter to the proper place.

Support your association which is supporting the National Maple Syrup Council. Don't sit back and let "George" do it.

This space sponsored by:

THE BERKSHIRE PIONEER MAPLE PRODUCERS ASSOCIATION
THE NEW YORK STATE MAPLE PRODUCERS ASSOCIATION
THE VERMONT SUGAR MAKERS ASSOCIATION

Don't wait for someone to call on you. They're not getting paid to chase you all over the country!!

THE "DIGEST" MUST BE WORTH *SOMETHING!!!!*

In the last issue, we asked each producer to contribute a dollar or two, or whatever you think it's worth, to help pay the cost of publishing the "Digest." Many contributions have been received.

ARE YOU DOING YOUR SHARE??

Send your dollars to:

The Maple Syrup Digest
Bainbridge,
New York

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The population of the United States is 186 million, but there are 66 million over 60 years of age, leaving 120 million to do all the work. People under 21, total 61 million which leaves 59 million to do the work: 32 million Government employees who do practically nothing; leaves 27 million to do the work. Six million in the armed forces leaves 21 million workers. Deduct 18 million State, County and City employees who do almost as little as the Government employees and you have only 3 million left to do the work. There are 2,500,000 people in hospitals, asylums, etc. leaving 500,000 workers. But 450,000 of these are bums or others who will not work, so that leaves only 50,000. Now, it may interest you to know that there are 49,998 people in jail, so that leaves just two people to do all the work, and that is you and me, brother, so you better get busy, 'cause I'm getting doggoned tired of doing everything by myself.

Back Issues

In 1962, the ***Digest*** was published four times, in January, February, July and November, or, Volume 1 issues No. 1, 2, 3, and 4.

If you have not received all four issues, you may do so by dropping a card to the ***Maple Syrup Digest,*** Bainbridge, New York. Be sure to state which issue(s) you lack.

Occasionally, we print an article that is worthwhile. They may not be helpful right now, but sometime in the future, you may want to refer to one of them. Therefore, we suggest you file your copies.

We expect the day will come when we will run out of extra copies, and reprints will be very expensive.

Drops in the Bucket by Fred Winch

The last issue of the ***Digest*** reported that a resolution of the National Council regarding maple diseases was forwarded to proper authorities. Results have already been obtained! D.R. Houston, who reported at the meeting on some of the work that has been done, is to be assigned full time to this problem according to the Forestry Research Advisory Council. Director Jorgenson of the Office of Experiment Stations, U. S. Department of Agriculture, has also acknowledged the resolution and has called it to the attention of the states concerned. It's rather interesting to note the effect of an organization in getting things done!

* * * *

Dr. Aaron Wasserman, bacteriologist at the U.S.D.A. Research Lab., has been working with some of the "bugs"—yeasts, molds, and bacteria —that contaminate the sap in the bucket. He has found that there are some of these "bugs" that can be "cultivated" and they will ferment out the "bud" in buddy sap. The syrup made from such sap "is not bad" and could be classed as "Fancy."

* * * *

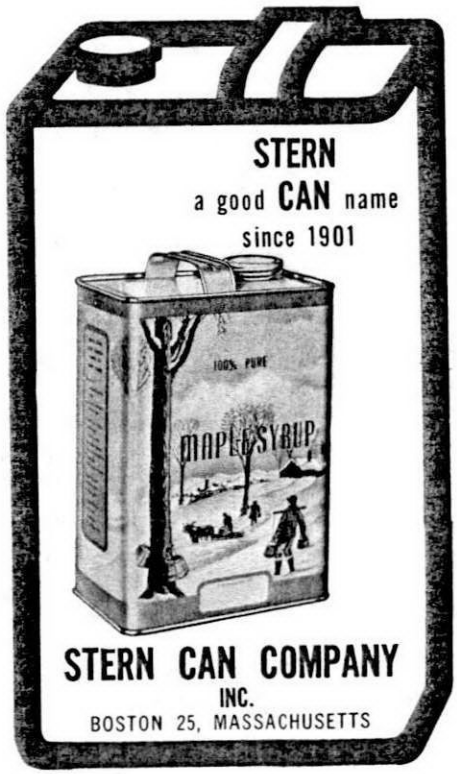
At a recent New York meeting one producer operating in the western part of the state told of his experiment with a covered evaporator. He separated his pans on the evaporator and sucked the steam down into the fire box of his wood-burning evaporator – Result: 1) no steam in the house; 2) "used less wood;" 3) the bottom of the flue pan was as clean as a whistle. Now there are at least five ideas by other folks to try the same technique or adaptations of it.

* * * *

Shortly your maple institutes, maple schools, maple forums and farmers' days will be held in your state (Indiana has led off with some already). Get in touch with your county agent or your association and plan now to attend the session nearest you. So much is happening in the maple business that you better be there! The ***Digest*** can't publish an up-to-the-minute list but some firm dates will be published. Ohio is holding four different meetings this year.

* * * *

The northeast had some real maple weather November 26 'til December 6! Temperatures in the 40's–50's daytime, and 20's at night–at least in the valley's–sap ran like all get out! After Mr. Beabe's talk at Philadelphia it's interesting to see how many put out a few buckets this fall. One producer got "several gallons of sap" per bucket that tested 3.5° Brix! Many others report "it tasted like 3% sap."



CENTRAL NEW YORK WORKSHOP

The second Annual Maple Workshop was held on December 3 and 4, 1962 in the Chenango County Farm, Home & 4–H Center, Norwich, New York. The workshop was sponsored through the combined cooperation of the Department of Conservation at Cornell, the New York State Extension Service, the Central New York Extension Service Association and the United States Department of Agriculture's Eastern Utilization Laboratory at Philadelphia, Pa.

Sixty-five maple producers from nine Central New York counties and the Province of Quebec attended the two-day session. The general theme of the program was to discuss, in detail, the production of maple products. Experienced maple producers were invited to the meeting, not only as an audience, but also to relate some of their methods and experiences in the maple business.

The principal speakers included Dr. C.O. Willits and Dr. A. Wasserman (staff members of the U.S.D.A.'s Eastern Utilization Laboratory in Philadelphia), Lloyd Sipple and Charles Hagar, maple producers; Robert Lamb, maple equipment dealer and Fred W. Winch, Jr., Cornell Extension Forester, who was also general chairman and supervisor of the meeting.

The first afternoon's program included a discussion by Dr. A. Wasserman concerning sanitation in the woods, equipment, and in the evaporator house for the control of bacteria and production of a quality product. Dr. Willits followed with the chemistry of maple syrup. The remainder of the afternoon was devoted to fuels, oil burners, covered evaporators, finishing pan operation and the use of automatic controls in drawing off syrup. Dinner was served in the Farm, Home & 4-H Center and was followed by a workshop session on measuring syrup density and taste testing to detect off-flavor in syrup. Robert Lamb topped the evening session with moving pictures of the overall maple industry in several areas of the maple region. An excellent film was shown on the use of tubing in collecting sap.

Dr. Willits and Dr. Wasserman started the second day's session off with some ideas on why maple flavor is as it is and the latest in the microbiology of sap and syrup. A new film "Modern Maple Confections" was shown and followed by a very informative discussion and demonstration of candy and cream making, the whys, whens and hows of crystal coating and a look at new marketing areas by means of new and different maple products such as "high density syrup" and maple fluff.

Mr. Lloyd Sipple of Sipple Maple Products and editor of your ***Maple Digest*** discussed his experience with oil burners and made some very interesting technical and over-all comments about syrup production and the maple industry.

At noon of the second day the group adjourned knowing that they had been exposed to a detailed and intensive program of maple production technology, probably the most intensive ever offered to a group of maple producers in Central New York. The intensive approach idea is a method Extension is exploring as a means of getting information, such as that which was presented at this workshop, into the hands of the people, whether it be maple or any other agricultural field.

John Vanderwende
Assoc. Co. Agric. Agent

DROPS IN THE BUCKET (Continued)

By the way—where is the ideal spot for a sugar bush? The old idea that the hill-top is the best area is open to question. The sap producer wants warm days and cool nights—rapid and drastic fluctuation in temperature. Up on my hill the temperature during this Indian Summer period ran only from the low 30's to the high 40's—many times not even freezing. Down in the valley temperatures for the same days ran from 18° to 65°—where was the best sap production?—you said it—in the valley!

* * * *

When do you check your boiling point of water? The good operator has been doing it every day, several times a day. As an indicator as to when weather and barometric pressure is changing why not get a good barometer and put it in your sugar house? Set both hands together and when they separate (pressure has changed) recalibrate for then the boiling point has changed.

* * * *

Rumor has it that there is a gadget that can be set on your automatic drawoff that requires "no calibration" put one thermister (temperature sensitive rod) in the pan where raw sap first boils—one in your syrup drawoff area—when there is a difference of 7° F., or 7½° F. (your choice) the drawoff valve will open!

* * * *

In spite of the excellent crop of syrup made this year in most areas it is rather discouraging to see how many producers are trying to buy syrup to make out their Christmas orders! Some are talking of buying back syrup from the bulk buyers. Maple is a storeable commodity, like money in the bank, don't get excited every spring and sell too much bulk. Heavy appetites occur from December 'til sap season—sell them.

* * * *

But if you need to have a new product why not try Hy-flavor maple syrup for your dairy bars, restaurant and pancake house trade? Heat your syrup in an autoclave or pressure cooker (put syrup in jars or cans with loose fitting lids on a rack along with water enough for about one hour) bring temperature up to 252° F. Hold it at that temperature 'til you can smell a trace of caramel (about 40-50 minutes). Remove and bring back syrup to 65.5° B. to 67° B. by replacing water driven off. This will enhance flavor about four times.

* * * *

And as a last drop or two—attend a maple school or institute this year—support your association!

MAPLE SCHOOLS

January is the month the maple schools, institutes and meetings get into full swing. So far, our list of dates is very incomplete and indefinite. Rather than publish wrong dates and confuse the producers, we have left them out entirely and urge you to contact your County Extension Agent.

And, doggone it, when you find out when your meeting is – GO!! Listen to what is said and make use of all the work those guys are going to, just to help you make a profit!!

And while you're there, JOIN your Local Maple Producers Association.

ELDIE SEZ–

That's a mighty small pill for such a big tree, but it's just what the Doc ordered (Dr. Willits, that is), and it sure does a whale of a job.

Now if you want the best insurance you can buy against a poor crop of syrup, and at the same time keep your banker smiling instead of breathing down your neck when you don't pay your note on time, you better use **FLOMOR PELLETS** in every tap hole.

Them bankers have a way of a scowlin' and thinkin' we don't 'mount to much if we have a poor season, so write to **BOB LAMB** in **LIVERPOOL, N.Y.** for all the latest dope on

FLOMOR PELLETS

PRECISION INSTRUMENTS

Use of Precision Instruments in Testing for Standard Density Syrup

Probably more head-scratching has resulted from trying to use precision instruments in testing syrup than from any other part of maple making. Even the precision scoop shows some problems so that here we'll try to get down to language – and facts – that anyone can use. The right instruments are available and are ***cheap*** in relation to the accuracy of the syrup made. Thermometers are the fastest indicators while hydrometry is the most accurate. Thus, many sugar makers set their thermometer by a hydrometer instead of by determing the temperature water boils at. As concentration progresses, there is a progressive increase in the boiling point, in density, and in refractive index. These can be measured accurately with a thermometer, a hydrometer, and a refractometer, respectively. However, only the measurement of the elevation of the boiling point is applicable to a sugar-water solution, such as sap, while it is actively boiling.

Elevation of the Boiling Point

Chart 1 shows the changes in boiling-point temperature for sugar solutions at different concentrations. When a sugar solution has been evaporated to the concentration of a standard-density syrup (65.46 percent of sugar or 65.46° Brix), its boiling point has been elevated 6.85°F. above the boiling point of water. Between 0° and 27° Brix, there is only a slight elevation in boiling point. However, as the solution nears the concentration of standard-density syrup, a change of only 2.5 percent in sugar concentration (from 64.5° to 67° Brix) raises the boiling point 1° F. Hence, in this region the boiling-point method is ideally suited to syrup-making.

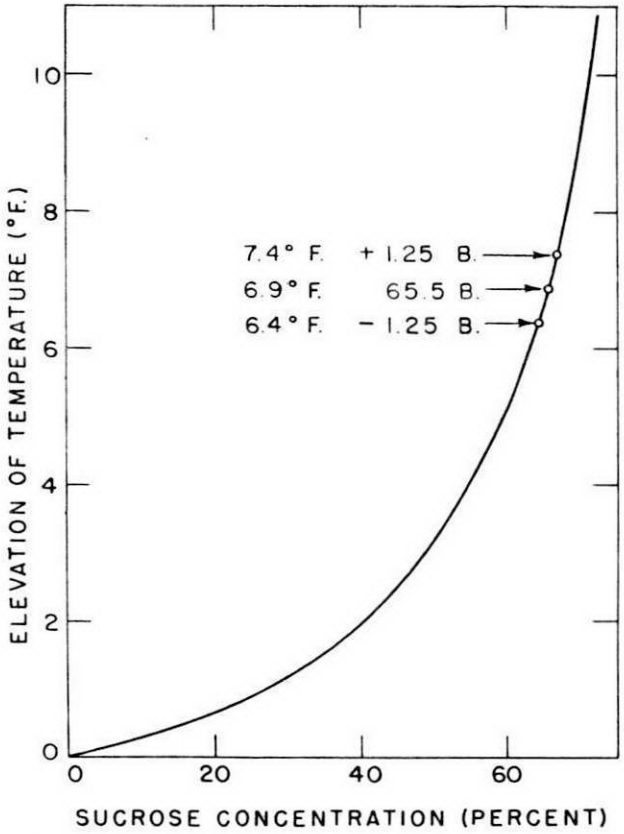


Chart 11.—Curve showing the relationship between the concentration of a sugar solution (sap) and the elevation of its boiling point above the boiling point of water.

Any Fahrenheit thermometer calibrated in 1/2-degree or 1/4-degree intervals and with a range that includes 225° F. can be used. For greatest usefulness and accuracy the distances between degree lines should be as open as possible. The thermometer pictured here is designed for use in maple syrup evaporators and reads 1/4-F. differences. It is the most accurate thermometer made for checking maple syrup. For example, 1/4° F. difference indicates 1/2° Brix (or 1/2 percent sugar.) Its cost (about $45) is not excessive when the accuracy of the instrument prevents overdense syrup. For example, if a producer made 200 gallons of 68° Brix syrup, he will waste enough sugar to pay for two thermometers in one year.

Elevation of the boiling point as used here means the increase in temperature (° F.) of the boiling point of the sugar solution above the temperature of boiling pure water. It has nothing to do with the specific temperature 212° F. Water seldom boils at 212° F.

A much safer and the recommended procedure is to establish the temperature of boiling water on the day and and at the place syrup is being made. In practice, the boiling sap in the sap pan can be used to establish the temperature of boiling water. The boiling temperature of minimum density syrup is then found by adding 7 to the temperature of the boiling sap. For a more desirable syrup (66.5° B) a temperature of 7½° F. above the boiling point of water must be reached.

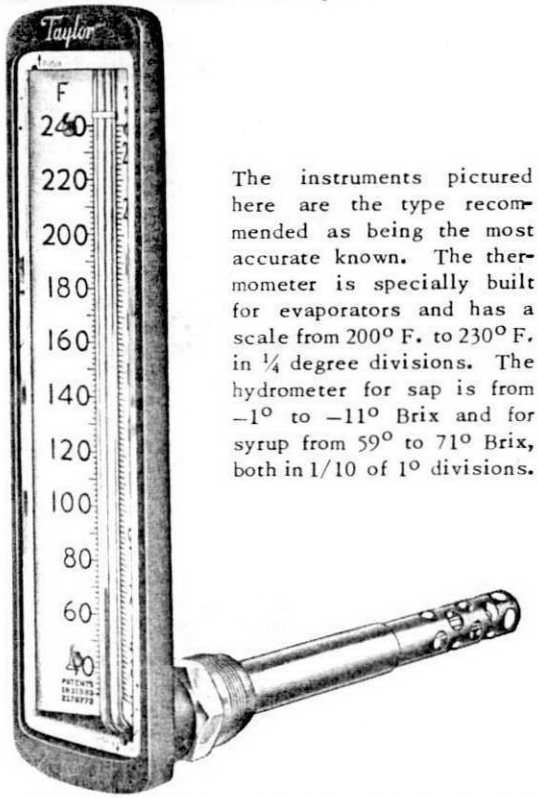
It is of the greatest importance to redetermine the temperature of boiling water (sap) at least once and preferably several times each day, especially if the barometer is changing as noted by a change in the weather. In practice, this method of determining the boiling point of syrup is not always accurate since there are many variables to consider. One is the rate of boil at spot where thermometer is to be calibrated in flue pan. Thus a hydrometer should be used as a final check on the density of the syrup and to find the boiling point of the syrup.

Use of Hydrometers

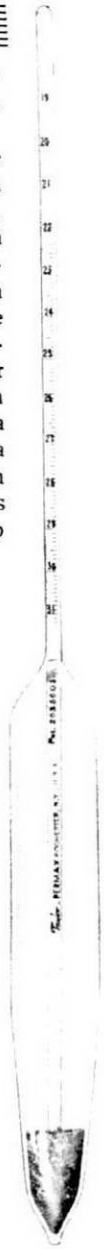
The density of all maple syrups must be maintained within very narrow limits, corresponding to a range of only 1.5° Brix (65.5° – 67.0° Brix). If the density is below 65.5° Brix, it will not meet minimum State and and Federal standards, it will taste watery and it will be more conducive to microbial growth. Syrup with densities above 67° Brix are supersaturated at room temperatures and will tend to crystallize on storage, forming unattractive crystalline deposits (rock candy) in the container. More important, these heavy syrups reduce the amount of syrup that could be produced from a given sap crop and result in a loss of income for the syrup producer. The measurement and adjustment of the density of all maple syrups that are for sale, therefore, is an absolute requirement.

The degrees Brix of sap or of syrup may be readily measured by hydrometry. Since hydrometry utilizes inexpensive instruments, the hydrometer, hydrometer cup, and a thermometer, it is the most commonly used method. The hydrometer must be a precision instrument that will cause an easily observable change in the depth at which the hydrometer stem floats. The scale contained in the hydrometer stem, whether it is in degrees Brix, degrees Baume, or specific gravity, has no influence upon the sensitivity of the instrument itself. The Brix scale is preferable since its scale values give directly the percent solids content of the sap or syrup in terms of percent sugar.

To make exact density measurements, sensitive hydrometers that can be read with high precision must be used. The hydrometer stem, therefore, must be of sufficiently small diameter so that a change in the density of the sap or syrup equivalent to 0.1° Brix (percent sugar) will cause an observable change in the depth at which the hydrometer stem floats, as measured at the intersection of the liquid surface and the hydrometer stem. Such a hydrometer will have a scale with 0.1° Brix graduations and will usually cover a range of 10° to 12° Brix. This will require a stem length of approximately 6½ inches and an overall hydrometer length of about 13 inches. This type of hydrometer will require a hydrometer cup of at least 13 inches in depth.



The instruments pictured here are the type recommended as being the most accurate known. The thermometer is specially built for evaporators and has a scale from 200° F. to 230° F. in ¼ degree divisions. The hydrometer for sap is from −1° to −11° Brix and for syrup from 59° to 71° Brix, both in 1/10 of 1° divisions.



Since the Brix scale gives densities of sap or syrup directly in terms of dissolved solids as percent sugar, it is ideally suited for use by the maple industry.

Maple Syrup – Measuring Its Solids (Sugar) Content

The effect of temperature on the density (degrees Brix) is more pronounced in syrup than in sap. No syrup must be allowed on that part of the hydrometer stem that is exposed above the surface of the syrup being tested. The hydrometer must be clean and dry, it must be inserted with clean fingers, and ***must not be submerged too far and permitted to rise*** to its floating position. Syrup on the exposed stem of the hydrometer will add weight to the hydrometer stem, causing the hydrometer to float too deep in the syrup so that the observed reading will be

(Continued on page 10)

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PRECISION INSTRUMENTS

(Continued)

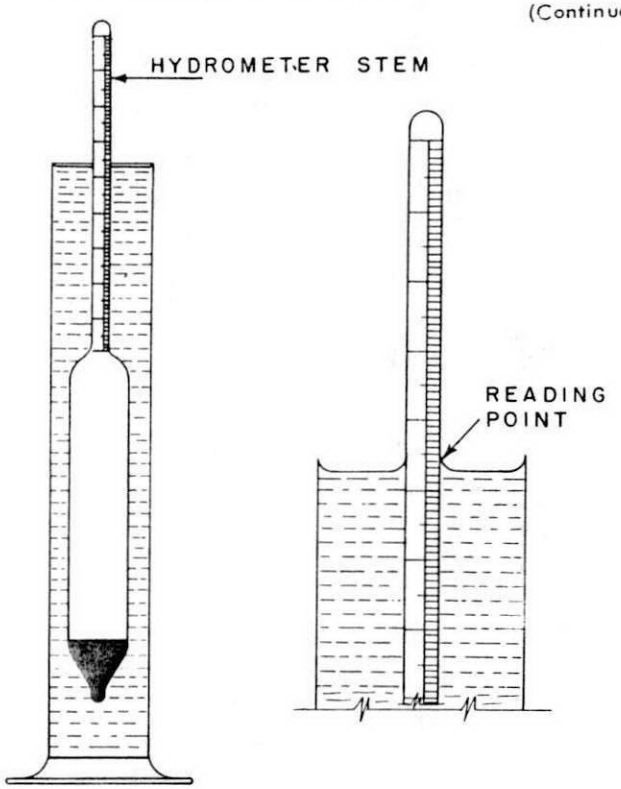


Chart 15.—Hydrometer, an instrument for measuring density. The hydrometer can should be filled to the top and the hydrometer should be read by holding the top of the can at eye level.

low and incorrect. The hydrometer will take longer to settle to its point of rest in syrup than in sap and so observed hydrometer readings, if made too soon, will be high and incorrect. Also, if the diameter of the hydrometer cup is too small, or if the hydrometer is floated too close to the wall of the cup, the movement of the hydrometer will be restricted and incorrect observed Brix values will be obtained.

To determine accurately the sugar content of maple syrup, use a hydrometer calibrated in 0.1° Brix. Place the syrup in a hydrometer cup whose depth is equal to the overall length of hydrometer and whose diameter is at least 1½ times larger than the diameter of the hydrometer bulb. Fill the hydrometer cup to the top with syrup, and gently set the hydrometer into the syrup, allowing it to settle unaided until it comes to rest. When the hydrometer comes to rest, at least 30 seconds after placing the hydrometer in the cup, lift the cup so that the liquid surface is at eye level. Read the marking on the hydrometer scale at the point of intersection of the hydrometer stem and the liquid surface. This value is the observed hydrometer reading (degrees Brix of the syrup).

All Brix hydrometers are calibrated for use at 68° F. This does not mean that syrup must be heated or cooled until it is 68° F. before its density measurement can be made. Actually, the density can be measured at any temperature and the true density or degrees Brix calculated, provided that the exact temperature of the syrup, at the time this reading was made, is known. The temperature measurements of the syrup should be made with a precision Fahrenheit thermometer calibrated in intervals of 1.0°, or preferably 0.5°. Knowing the observed degrees Brix and the temperature of the syrup, the correction for temperature effect can then be calculated. To avoid the necessity of making these calculations, Table 1 has been prepared which shows the amount to be added to or subtracted from the observed degrees Brix readings to obtain the true degrees Brix of syrup measured at some temperature other than 68° F. The upper part of Table 1 shows the corrections for syrup at temperatures below 68° F. which must be subtracted from the observed hydrometer readings, and the lower part shows the corrections for syrup at temperatures above 68° F. which must be added to the observed hydrometer reading.

CORRECTIONS TO BE ADDED (+) TO, OR SUBTRACTED (–) FROM, OBSERVED HYDROMETER READINGS FOR SYRUPS AT DIFFERENT TEMPERATURES

to correct these readings to those that would be obtained if the syrups were at 68° F.

Temperature F.	DEGREES BRIX (% of solids as sugar) Correction	DIRECT Hydrometer Reading for 65.5 Syrup	DIRECT Hydrometer Reading for 66.5 Syrup
40	−1.32	66.82	67.82
45	−1.28	66.78	67.78
50	−0.86	66.36	67.36
55	−0.61	66.11	67.11
60	−0.39	65.89	66.89
65	−0.14	65.64	66.64
68	0.00	65.50	66.50
70	+0.09	65.41	66.41
75	+0.33	65.17	66.17
80	+0.56	64.94	65.94
85	+0.80	64.70	65.70
90	+1.03	64.47	65.47
95	+1.27	64.23	65.23
100	+1.50	64.00	65.00
105	+1.74	63.76	64.76
110	+1.97	63.53	64.53
115	+2.21	63.29	64.29
120	+2.44	63.06	64.06
125	+2.68	62.82	63.82
130	+2.91	62.59	63.59
135	+3.15	62.35	63.35
140	+3.38	62.12	63.12
145	+3.62	61.88	62.88
150	+3.85	61.65	62.65
155	+4.09	61.41	62.41
160	+4.32	61.18	62.18
165	+4.56	60.94	61.94
170	+4.79	60.71	61.71
175	+5.03	60.47	61.47
180	+5.26	60.24	61.24
185	+5.50	60.00	61.00
190	+5.73	59.77	60.77
195	+5.97	59.53	60.53
200	+6.20	59.30	60.30
205	+6.44	59.06	60.06
210(hot test)	+6.67	58.83	59.83

The Density of Hot Syrup Estimated by the "Hot Test" Method

The "hot test" is often used to judge whether or not the process of evaporating sap to syrup is completed. This is usually done by taking a hydrometer cup full of the boiling syrup and, as quickly as possible, measuring the syrup density with a hydrometer.

The testing of hot syrup (immediately after it is removed from the evaporator or finishing pan) ***is not a precise measurement.*** It is extremely difficult to make accurate hydrometer and temperature readings at the same time in syrup that is hotter than 180° F. because the syrup is undergoing rapid temperature changes.

From the time the hydrometer cup is filled with boiling syrup until the observed hydrometer reading is made, the syrup will have cooled several degrees. The amount of cooling will depend upon the length of time involved and the temperature of the air surrounding the hydrometer cup.

The "hot test" is made as follows: fill the hydrometer cup with boiling syrup from the evaporator or finishing pan. Immediately place the hydrometer in the syrup and, as soon as the hydrometer comes to rest, make the observed density reading. All operations should be performed as quickly as possible. If the observed hydrometer reading is between 58.8° and 59.1° Brix, the evaporation of the sap to standard syrup density is completed. If this same syrup were cooled to 68° F., without further evaporation, it would test 65.5° to 65.8° Brix.

To make this "hot test" as precise as possible, the hot syrup temperature must be between 210° and 218° F. at the moment the hydrometer reading is made. To be sure that the syrup is in this temperature range, first determine the temperature of the hot syrup in the following way. Fill the hydrometer cup with boiling syrup. Then, instead of reading the hydrometer, measure the temperature as soon as the hydrometer comes to rest. Repeat this procedure and, if the two consecutive temperature readings are not obtained in the range of 210° to 218° F. practice speeding up the different steps of the operation until these temperatures are obtained at the time hydrometer readings would be made.

Do not be satisfied with the readings obtained in the evaporator as syrup is drawn off. In filtering, in holding cans, and also in filling of cans some, and often much, vapor loss occurs so that syrup canned may well be excessively heavy; this will result in crystallization in the container.

How to Make Standard Density Syrup:

1. Use only the most accurate instruments available—they're cheapest in the long run.

2. Develop your own standard method of testing. The most desirable table syrup has a density of 66.5° Brix.

3. Any thermometer used alone is not accurate enough. All syrup should be checked with a hydrometer both at the draw-off and when it is canned.

4. In using a hydrometer for testing syrup at any temperature, it is only accurate when the temperature of the syrup is known and the proper temperature correction is made.

A condensation of two U.S. Department of Agriculture Publications: Agricultural Handbook No. 134, **Maple Sirup Producers Manual** by C.O. Willets and ARS 73–28, **Measuring the Sugar in Maple Sap and Sirup** by C.O. Willets, H.A. Frank and J.C. Underwood.

ATTEND YOUR MAPLE SCHOOL

and

JOIN YOUR MAPLE ASSOCIATION

PACKAGING

The graded and clarified sirup of correct density (between 65.5° and 67° Brix at a temperature of 68° F.) is ready for packaging. If the temperature of the sirup when tested after filtering is still above 180°, the sirup can be packaged immediately. If the sirup has cooled below 180° it must be reheated. However, the sirup may become darkened if the temperature goes above 200° when it is reheated.

As stated previously, maple sirup is a water solution. Like water, a given quantity of sirup (by weight) expands and contracts with changes in temperature. For this reason it is difficult to package sirup accurately by volume. When the package of hot sirup has cooled it may not contain exactly the specified volume.

On the other hand, the weight of a given quantity of sirup of standard density is the same regardless of the temperature of the sirup. For this reason it is best to package maple sirup by weight. The sirup can be weighed on ordinary household scales. However, it is advisable to test the scale before it is used. This can be done by taking the scale to a grocery store and comparing it with the grocer's certified scales. To do this, weigh an object that weighs exactly 1, 2, or 10 pounds (such as a bag of sugar or a can of water) on the grocer's scale. Then weigh it on the scale being tested. If possible, adjust the household scale to make it read correctly. If it cannot be adjusted, make a calibration chart by recording in one column the household scale reading and in the other the corresponding true weight.

When packaging sirup by weight, allowance must be made for the weight of the container. The net weights most commonly used for standard-density sirup are:

1 gallon weighs 11 pounds; 1 quart weighs 2 pound, 12 ounces; and 1 pint weighs 1 pound, 6 ounces.

After the container is filled with the correct weight of sirup, the closure is affixed and the container is laid on its side so that the hot sirup is in contact with the closure and pasteurizes it. After the containers have been on their sides 10 to 15 minutes they are ready for cooling.

Stack Burn

If packaged sirup is stacked while it is still hot the same browning reaction that occurred in the evaporator will continue and cause a darkening of the sirup by as much as 1 or 2 grades. This development of color in hot packaged sirup is called "stack burn." To prevent stack burn, the containers should be placed in cold water or spaced 3 or 4 inches apart to cool before stacking.

Control of Micro-Organisms

Standard-density sirup will not support active growth of micro-organisms with the exception of one type of yeast. Because of the possible contamination of sirup with this yeast no sirup that is offered for sale to the consumer should be packaged cold. Instead the sirup must be heated to at least 180° F., to destroy the yeast, and packaged immediately.

Although everyone has seen mold growing *on* sirup, mold will not grow *in* standard-density sirup. These apparently contradictory statements are explained as follows: Maple sirup that is cold-packed may contain mold spores. The mold spores will remain in a resting state and will not germinate as long as all the sirup is of standard density.

Sirup stored under ordinary conditions usually undergoes some temperature change. When the storage temperature becomes warm, some of the water of the sirup is distilled up into the head space. When the storage temperature falls this vapor condenses into small drops of water that run down onto the surface of the sirup, producing a layer of low-density sirup in which mold spores can vegetate and grow.

Even though the sirup contains mold spores, growth of mold can be prevented by momentarily inverting the packaged sirup once or twice weekly (*22*). This destroys the layer of dilute sirup and therefore inhibits germination of the mold spores.

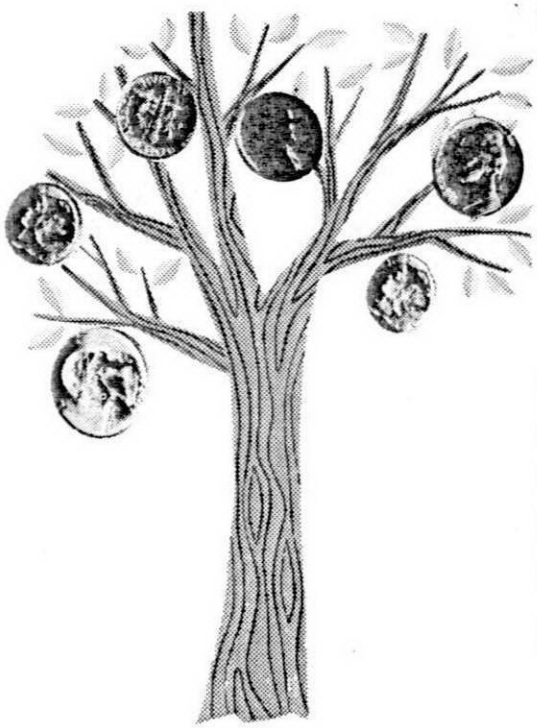
Even though sirup is packaged under clean, sanitary conditions, this does not guarantee that the sirup will not become inoculated with micro-organisms if it is packaged cold. Once a mold or yeast has grown in the area where cold packaging is done, it is almost impossible to package sirup by the cold method without its becoming infected.

Size and Type of Package

The size and type of package is important when sirup is made for retail sale. The housewife dislikes to repackage sirup from a gallon container to smaller ones which can be used as occasion demands. This has been demonstrated by the growing tendency on the part of the public to buy maple sirup in quart or even smaller packages.

The consumer expects sirup to be as attractively packaged as other foods (fig. 61). The day is gone when leftover mayonnaise jars, soft-drink bottles, and the like are acceptable containers. When sold at roadside stands, sirup packaged in tin is attractive to the tourist regardless of the size of the container, because he does not have to take special care in storing it in the car as with glass containers. Either glass or tin packages must be attractively labeled. The printed label must be put on squarely, and the outside must be clean. Many producers are finding that cans with the labels lithographed on the tin make an ideal package.

What is this dollar sign doing here? Well, they say, money can't buy happiness, but it sure makes it a lot easier to endure the misery. Maybe so, but whether we like it or not — dollars are pretty important things. You make syrup to make money. You spend money to make syrup. You spend money on supplies — that's why we have ads in the Digest. It takes a lot of dollars to print the Digest and mail it to you. It takes more dollars to finance the extension service that puts on your maple schools. And what happens? The producers who are making a profit show up at the schools to learn more, while the ones who aren't making a profit stay home and complain because they can't make any dollars. Then, there's this talk about the difference of the exchange rate on the Canadian and U. S. dollars, and how it will lower the price of our syrup. I can't see where there's any problem unless there's a surplus and there certainly is no surplus when the entire U. S. crop of maple syrup represents only one fluid ounce per person. It's just a matter of distribution. This can't be corrected by every producer but many can help. They've just got to get out and get this syrup where the customers can buy it. This will be discussed at many of the maple schools this winter so every maple producer has an obligation to do these things NOW!



Attend your local maple school

Join your maple producers' association.

Send your contribution to the "Digest".

Improve your production methods.

Produce better quality, standard density syrup.

Make the MAPLE TREE
A MONEY TREE
IN '63

CLASSIFIED

EVAPORATORS–New and used, Lamb Tubing–Orlon Filters–Name Stickers–Cans–Tappers–Sap and Syrup Pumps–Cartons–Grade Kits–Everything for the Maple Producer, large or small. **LESURE FARM,** Ashfield, Mass.

MAPLE TUBING and other supplies by Lamb; electric tappers, pumps and mailing cartons at a saving. Send for 1963 tubing book or prices. **K. O. PROCTOR** Poultney, Vt.

ATTENTION: Connecticut Valley and New Hampshire maple producers: Lamb tubing, Flo-more Pellets. **GORDON GOWEN,** Alstead, N.H. TE 5–6531

COUSIN CLEM cooked sap with a wood fire, "'cus," he said, "shuks, I got lots of wood." He also made dark syrup, seasoned with fly ash. He burnt his pans, burned up his cooking shanty and blamed it all on the Devil. Be safe – fire with oil. OIL IS safe, clean, and economical. Write to **LES JONES,** Holcombe, Wisconsin (12 years experience in oil firing).

FOR SALE – Two, 2-inch flexible King pan connectors with nipples and collars. A steal at $12.00. **LES JONES,** Holcombe, Wisconsin.

FOR SALE – 4' x 14' Vermont Evaporator – Pure maple syrup in quarts, half-gallons and gallons. We mail anywhere. **HILLENDALE FARMS,** Franklinville, New York. Phone 3094.

RECENT PUBLICATIONS ON MAPLE PRODUCTS BY EASTERN UTILIZATION RESEARCH AND DEVELOPMENT DIVISION

U.S. Department of Agriculture
600 East Mermaid Lane
Philadelphia 18, Pa.

Maple Sirup. XIX. Flavor and Color Through Controlled Fermentation of Maple Sap. Willits, C.O., H.A. Frank, and R.A. Bell Food Technol. 15, 473–4 (1961)

Maple Sirup. XX. Conversion of "Buddy" Maple Sap into Normal Maple Sirup. Wasserman, A.E. and C.O. Willits Food Technol. 15, 438–9 (1961)

The Use of Plastic Tubing for Collecting and Transporting Maple Sap. Willits, C.O. and Lloyd Sipple. U.S. Dept. Agr. Circ. ARS 73–35 (November 1961)

The Efficiency and Practicability of Different Types of Paraformaldehyde Pellets for Controlling Microbial Growth in Maple Tree Tapholes. Costilow, R.N., P.W. Robbins, R.J. Simmons and C.O. Willits – Michigan Agr. Expt. Sta. Quart. Bull. 44, 559–79 (1962), Michigan State University, East Lansing, Michigan

Lamb's Corner

GENERAL MAPLE MOVIES AVAILABLE

As mentioned in the November issue of the ***Digest,*** we have some good progressive maple movies available, at no charge, for Maple Meetings. Dr. C. O. Willits has viewed the new ones and could advise as to their use at a maple meeting. A member of Dr. Willits' staff is usually present at most maple meetings, or are available to help, just for the asking.

These movies tell a general story over the whole maple belt, progress and effort in action.

One 1962 Perfectionist Film: A complete operation, covering from tapping to the making of maple candy. Here one man that could stay awake for the entire maple season can easily make 6000 gallons of syrup alone. As it is, it takes two men! (24 frames, no sound – 25 minutes, 16mm color.)

One 1962 General Progressive Film: Covering from New Hampshire through to Minnesota of many practical, successful operations. Including, not the largest operation in the world, but the Reynolds of Aniwa, Wisconsin, who is twice as large as anyone else in the world! (24 frames, no sound – 25 minutes, 16 mm color.)

Then there is a good general 1961 film of the entire maple area, that many have not seen. This is 16 mm color, 16 frames – 35 minutes, no sound. Also we have a 15-minute tubing teaching film that Cornell University helped me put together. 16 mm color, 16 frames – no sound.

We have no time for anything that does not help maple!

LAMB ¼" CHANGE-OVER EXCHANGE DEAL TO ALL 5/16"

As we have mentioned before, if you have any ***Lamb*** ¼" tubing and fittings, please think about this: Through the years, most users prefer all 5/16" tubing rather than the ¼" spile and drop line to the ground where they attach to the 5/16" lines.

We have decided to offer any user the opportunity to exchange his ¼" tubing and fittings for 5/16" tubing and fittings if he feels it is to his advantage.

Our suggestion is that we will allow any customer half the list price for his ¼" drop lines and fittings against the list price of the 5/16" tubing and fittings.

This is a direct deal with us, but some of our dealers will handle it for you, just to be accomodating. Also, there is no deadline to get under to take advantage of this offer, we expect to continue it for a few years.

BACK HOME BY OUR WOODSHED (OSCEOLA, THAT IS!)

Just for fun, I mentioned our wood pile in the November issue, and just for fun, folks ain't letting me forget it.

Our woodshed is full, clear to the back door, just leaving a good straight runway through to the privy, plus three extra wood piles outdoors. It gets awful cold up in our country, and an oil burner will just freeze right solid, and it snows so hard, a feller has to keep moving or he can't climb out, jes like going up a ladder.

Then the fogs–a few years ago, one morning we had one of our awful heavy fogs. Those fogs are so thick and so heavy, a man has a hard job to do much of anything.

Frank, a neighbor of ours, an awful hard worker, was shingling the roof of his barn. Well, that morning he climbs up on top of his barn, and tho' he couldn't hardly see the shingles, he starts a hammering away. That fog was so thick, 'fore he knew it, he had shingled 20 feet off the end of his roof onto that fog.

A few minutes later a breeze came up and started pushing that fog around. Poor Frank was up there in the air on them shingles, in the fog, and he started off across the valley, like an angel pushing clouds around.

A few minutes later, it had cleared enough in one spot so he could look down, and below him in the valley, Ken was just asweepin off the front steps of his general store for the day's trading. (Ken always said, "the customers bring in enough fresh dirt, without tracking in any old dirt off the front steps.")

Ken looks up and says "Hi Frank," and Frank looks down and says, "Hi Ken." And then Frank drifted three miles further on to the other side of that valley 'fore he got off them shingles and down to the ground again!

Frank had an awful high barn.

Bob Lamb

THE RULE OF "86"

To find out how many gallons of sap it will take to make one gallon of syrup when you know the percent of sugar of the syrup, you must use the rule of "86".

For example: If you use a Brix hydrometer and find your sap has a sugar content of 2.7%, divide 2.7 into 86. This will give you 32, the number of gallons it will take to make a gallon of syrup. If the sap is only 2.0% it will take 43 gallons, etc.

You can also use this rule in reverse. If you know it takes 25 gallons of sap to make one gallon of syrup, divide 25 into 86. The result is 3.4%, the sugar content of the sap.

ENJOY yourselves. THESE are the GOOD OLD DAYS you're going to MISS in 1982 . . .

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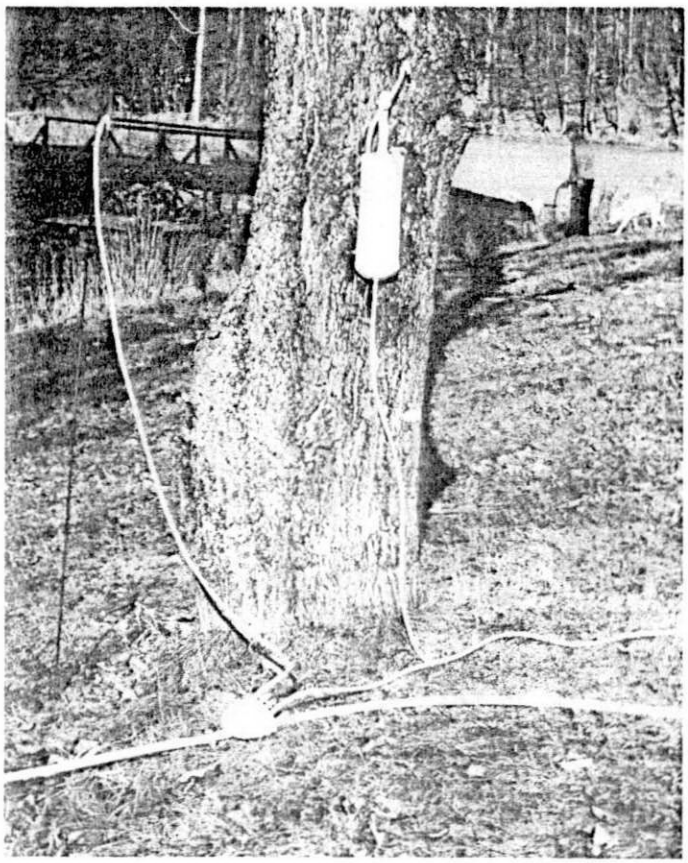
A main line properly installed over uneven ground.



The Sap Saver and Collector, set up in a suggestive way for their use.

Just a darn good installation.

SOME AREAS OPEN TO INVENTORY-STOCKING DEALERS

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