

# **MAPLE SYRUP**

**ADVANCED LEVEL**

**GUIDE FOR LEADERS AND YOUTH LEADERS**

## THE 4-H PLEDGE

"I pledge:  
My Head to clearer thinking  
My Heart to greater loyalty  
My Hands to larger service  
My Health to better living  
For my club, my community and my country."

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## **BE A "GREEN" 4-H CLUB**

The 4-H program uses a lot of paper. Please help us to reduce our costs, and save a few trees, by remembering these tips.

- Only 4-H members (10-21) and screened volunteers should receive 4-H resources.
- If your club plans to do this project again, keep the resource materials so you don't need to reorder.
- If your club has extra resources, please return them promptly to the Ontario Ministry of Agriculture, Food and Rural Affairs office so they can be used by someone else.

## **Welcome To 4-H**

It has often been said that volunteer 4-H leaders are a blend of friend, teacher and parent. What a big order to fill! But you will discover that you have many talents as a 4-H leader. Having an interest in young people and their development and being willing to take up the challenge of 4-H leadership is the first step to success.

This project focuses on maple syrup: its production, marketing and use. However, the development of members as individuals is your real goal. You will get to know the club members and where their interests lie very well. Use this knowledge, your own expertise and imagination to help members plan a fun, interesting and challenging club program. And enjoy being a 4-H leader!

## **Rationale**

This project will help build on members' knowledge and experience with maple syrup production. The project will help 4-H members develop basic skills in woodlot management, tubing set-up, mapping, refractometer use, judging, marketing and baking. 4-H members will develop a strong sense of the business behind maple syrup.

# Responsibilities

## 4-H Leaders

### Before your project begins:

1. Familiarize yourself with current provincial and local 4-H policies;
2. Attend a leader training session (if scheduled);
3. Advertise the project and organize a club with a minimum of six eligible members and one volunteer leader per club except in cases deemed to be unique and approved by the local 4-H Association; and
4. Review available resources and begin planning the club program.

### During the project:

1. Attend each meeting and the Achievement Program;
2. Assist members in planning and presenting the club program;
3. Provide a FUN, learning atmosphere;
4. Ensure the club membership list is completed and forwarded to the Ontario Ministry of Agriculture, Food and Rural Affairs office before the second meeting;
5. Order awards and project name plates once membership list is completed;
6. Help each member to set and achieve goals for personal development;
7. Encourage members to work together as a group;
8. Provide guidance in choosing and completing an Achievement Program; and
9. Evaluate the club program. Share the evaluation with the 4-H Association and the Ontario 4-H Council.

## 4-H Members

### General Requirements

See the Members' Manual page 1.

### Special Activities

Individual clubs will decide if junior and/or senior members need to complete a Special Activity. Here are some ideas for Special Activities. Encourage members to display or present the results of their activity. This could be done at a club meeting, the Achievement Program or another 4-H event.

### Junior Member Special Activity Ideas

1. Spend a day with a maple syrup producer. Keep a diary, write a poem, draw a cartoon strip, paint a picture or mount and label photographs about your experience.
2. Interview a person involved in the maple syrup industry. Prepare your questions ahead of time. Present the audio or video tape or do a written summary of the interview.
3. Use your artistic skills to sketch pictures, make a mural, a model, a collage or a mosaic of the sugar bush and/or things that happen in it. Write a sentence or two about why the picture fits with the maple syrup theme. Enter your art work in a local fair if possible.
4. Design a poster or flyer for a local maple syrup festival, maple syrup producer, your own operation or an imaginary operation. Apply your marketing knowledge.
5. Collect recipes made with maple products. Include recipes using maple syrup as a sweetener, a glaze, a filling, etc. Try at least one recipe at home and comment on the results.
6. Draw a map of your sugar bush. Include hills, streams, roads, the sugar shanty and the tubing system.
7. Invent your own idea for approval by your leader(s).

### Senior Member Special Activity Ideas

1. Do further research on some aspect of maple syrup making that interests you. Present your findings to the club (eg. insect pests, effects of acid rain, vacuum pumps, export markets for maple syrup, etc.).
2. Carry out a consumer survey or market research about maple syrup. Ask permission before doing any research in a store. Present your findings to your club.
3. Keep records on your maple syrup operation. Consider tracking some of the following:
  - expenses (spiles, tubing, buckets, evaporator, fuel, etc);
  - income (maple syrup sold);
  - amount of sap produced by each tree;
  - amount of sap collected each day;

- amount of sap collected over the entire season;
  - amount of sap produced compared to the temperature each day;
  - dates the season starts and ends;
  - amount of maple syrup produced compared to sap collected;
  - hours of work overall or in each stage of production.
4. Choose a recipe that does not have maple syrup in it. You might even choose a recipe from another country. Then, alter the ingredients by substituting maple syrup. Taste it! Compare the difference in taste and cost.
  5. Develop a video tape or slide show focused on the maple syrup theme. Arrange to show it to your club.
  6. Invent your own idea for approval by your leader(s).

## 4-H Club Program Planning

A successful 4-H club doesn't just happen! Careful planning is necessary and very important. As a 4-H leader, you have a responsibility to do the best job you can in providing a fun, learning experience for 4-H members. Planning will make this a reality.

The 4-H Volunteers' Handbook has lots of valuable information to help you and your members plan a successful club program. Refer to "The 4-H Meeting" section of your handbook for tips on planning successful meetings, effective communication, games, judging and special events. The chart on page 6 of this guide can be used to record your plans.

### What Is An Achievement Program?

- An opportunity for members to share with others the knowledge and skills they have gained during this 4-H project.
- Involves each member in some way.
- Informs the public about the purpose and goals of the 4-H program.

Achievement Program ideas specific to this project are suggested below. Your club may wish to choose one idea or combine a few. Involve club members in selecting a suitable idea and making the necessary preparations. Your club should choose what they want to do by the second meeting. Some time is given in meeting 6 for Achievement Program planning, however, members should be reminded of this activity each meeting. Your Achievement Program will be more organized and enjoyable if your club plans ahead.

Contact the local newspaper or radio station to tell them about your activity, the date, the time and where it will be held. Send a personal invitation to the group you plan to invite to the program or send a personal request from your club to visit an organization and present your Achievement Program. Don't forget to include parents/guardians and/or family members.

### **Achievement Program Ideas**

1. Have a maple bake sale. Give the money you make to charity or use it for club expenses. Ask a producer if you could sell his/her syrup, candy and maple butter at your bake sale. He/she might give you a commission on any sales. Don't forget to advertise.
2. Be tour guides! Volunteer to take a group of children through the sugar bush (eg. a grade one class, a Brownie pack). You could also volunteer to be tour guides for a local maple syrup producer or a maple sugar festival.
3. Organize a maple food fair or pancake brunch to highlight recipes that use maple products. Invite family, friends and sponsors to see what you've learned. Share recipes with your guests and have them pick the best one.
4. Arrange a meeting with local syrup producers. Develop a presentation (eg. songs, skits, poems and demonstrations). Show what you know about making maple syrup!
5. Use media skills to make a video or slide show about maple syrup. Present the show for friends and family, at a children's club, at school or for senior citizens.
6. Set up an exhibit at a local maple syrup festival. The exhibit could cover different aspects of maple syrup production. Members should be present to answer questions. Include an exhibit about the 4-H program.

# 4-H CLUB PROGRAM PLANNING CHART

MEETING OR EVENT	DATE	TOPIC ACTIVITY OR TASK	PEOPLE WHO COULD HELP	PRESENTATION IDEAS TO CONSIDER



7. Volunteer at a local maple festival. You could be involved in advertising by making posters and by giving out flyers. Promote an environmentally friendly festival. Your club could wash dishes instead of throwing away plastic plates and utensils. You might be able to make and serve pancakes. Don't forget to wear t-shirts or pins that show you are 4-H members.

## SPECIAL NOTES

1. This 4-H project is structured as follows.
  - General Members' Manual for members with little background in maple syrup production and who would like a basic introduction to the topic.
  - Advanced Members' Manual for members with more background in maple syrup production and who might wish to become producers themselves. It is a more detailed manual to meet these members' needs.
2. The Members' Manual has been designed as a reference source. Encourage members to leave their manuals closed for most of the meeting, allowing them to observe, learn and take part in the discussion and other activities. It is **not necessary to read** all the information given in the Members' Manual during the meeting.
3. You are free to change the order of meetings and information if you like. **Also, remember if you do rearrange the order of meetings, you might need to reorder the Before the Next Meeting Activities so that they fit with the Roll Calls.** The schedule of meeting dates can be recorded on page 2.
4. In most cases, the outdoor activities recommended are superior to their indoor alternatives. However, sometimes it is not possible to complete the outdoor activities for one reason or another. In these cases, try to bring the equipment and other objects to show the members. Most maple syrup producers will be willing to lend you equipment for a short period of time, depending on the season.

5. In each meeting of this guide there is a section titled, "Special Notes For This Meeting." This section discusses the possibility of guest speakers, meeting locations or meeting times. You should consult this section when planning your meeting schedule.

Remember to:

- share information in the Manuals and Guides with special guests;
  - remind members to wear appropriate clothing and bug repellent to outdoor meetings;
  - set up outdoor activities for daylight hours, especially in the winter and spring when days are short.
6. Some outdoor activities are best completed at certain times of the year. These cases are noted in the "Special Notes for This Meeting" section. In these cases an alternative activity is suggested.
  7. Page numbers refer to the Members' Manual unless otherwise indicated.
  8. Some clubs may wish to complete the outdoor activities in one or two long outings instead of several short outings. The chart below will help leaders to organize the outdoor activities.

<b>Advanced Members' Manual Outdoor Activities</b>	<b>Length of Time Needed (min.)</b>	<b>Meeting Number</b>	<b>Page Reference (This Guide)</b>
"Who Done It?" Tour	30	One	19
Thinning And Improving The Woodlot	15	Two	25
Selecting And Marking Crop Trees And Trees To Cut Down	35	Two	26
Measuring Sap Sweetness	35	Two	26
Tour of Bush With Tubing	45	Three	36
Mapping The Sugar Bush	30	Three	39
Field Trip to Operating Farm or Equipment Dealer	60	Four	41
Field Trip to Maple Syrup Festival	?	Five	44

# Additional Resources

## Books

- Most libraries have an assortment of books on tree identification. If you are doing the project in the winter, make sure the book includes bud and twig characteristics. The Audubon Society Field Guide to North American Trees (Eastern Region) by E.L. Little and published by Alfred A. Knopf, New York has excellent pictures and descriptions but does not include bud characteristics.
- Native Trees of Canada, by R.C. Hosie, is a valuable resource. It contains illustrations of leaves, twigs, bark and buds for tree identification and lists the uses of each tree. Check with your local library for this book. It is also available for \$21.95 from Canada Communications Group Publishing, Ottawa, Ontario, K1A 0F9, (819) 956-4800.
- Sugar Bush Management for Maple Syrup Producers, published by the Ministry of Natural Resources and the Ministry of Agriculture, Food and Rural Affairs, is also a useful resource. It especially applies to the meetings titled "Healthy Trees Make Happy Forests" and "Woodlot Wise." This resource is available for \$6.00 by mail from: Publications Ontario, 50 Grosvenor Street, Toronto, ON., M7A 1N8, (416) 326-5300, toll free 1-800-668-9938.

## Factsheets

- OMAFRA factsheet, Maple Syrup: Measuring Density (Agdex 310/70) (Order No. 89-111) It deals with the use of hydrometers and refractometers. (Suggested for the "Bubbling Gold" meeting.)
- Landowner Resource Centre factsheet, Extension Notes: Sugar Maple (Agdex 330). Check with your local Ministry of Natural Resources office or Conservation Authority. You can also contact the Landowner Resource Centre at 5524 Dickinson Street, Manotick, Ontario, K4M 1A5, (613) 692-2390 (613 area code users can call 1-800-387-5304). (Suggested for the "Healthy Trees Make Happy Forests" and "Woodlot Wise" meetings.)

## Audio Visual

- The following audio visual material is available from: A.V. Library, Communications Branch, OMAFRA, 52 Royal Road, Guelph, Ontario N1H 1G3, (519) 767-3622, fax (519) 824-9521.

Liquid Gold of Spring is a 12 min. video produced by the Ontario Maple Syrup Producer's Association. This video overviews the history of maple syrup production and more modern methods.

Ontario Maple Syrup is a 12 min. slide presentation produced by the Ontario Ministry of Agriculture, Food and Rural Affairs. The slides include a historical outline of how maple syrup was made and also includes more modern methods.

Maple Sugar Bush Management is a 35 min. video produced by the University of Guelph. It covers woodlot management including a section on sugar bush enemies. (Suggested for use in the "Healthy Trees Make Happy Forests" meeting.)

Maple Syrup Production is a 25 min. video produced by the University of Guelph. It looks at three syrup operations in varying stages of mechanization. (Suggested for use in the "Bubbling Gold" meeting.)

The library also has a 15 minute video (Frost and Fire) and a 17 minute film (Maple Syrup Makers). You should consult the Catalogue of Audio Visual Material produced by OMAFRA at your local field office to find out more about them.

## People

- The following people may be useful resources for information or equipment or as guest speakers.
  - a local maple syrup producer
  - a technician from the Ministry of Natural Resources
  - someone who is knowledgeable about tree identification
  - a person who is in the advertising or marketing field
  - a member of the Ontario Maple Syrup Producer's Association (Contact Ken McGregor, Sec./Treas., R.R. #6, Strathroy, ON., N7G 3H7, (519) 232-4596, fax (519) 232-9166, for a member near you.)
  - Maple Syrup Advisor, OMAFRA, Cedar Hill Plaza, 449 Dunlop St. West, Barrie, ON., L4N 1C3, (705) 725-7288 or toll free 1-800-461-9626
  - an equipment supplier (Suppliers are listed on page 12-13 of this guide for your convenience. It is current as of 1994.)

## Field Trips

- You might be interested in taking your club to The Maple Syrup Museum of Ontario. It is located on 8 Spring Street, St. Jacobs, Ontario, N0B 2N0, (519) 664-3626. Artifacts of maple syrup production are housed there.
- The November-April Events Guide produced by the Ministry of Tourism and Recreation lists maple events taking place in Ontario. You can obtain this free brochure by phoning 1-800-ONTARIO and asking for the Events Guide.

## Feedback

The 4-H Resource Development Subcommittee of the Ontario 4-H Council reviews and evaluates 4-H resources. Comments and suggestions about 4-H manuals and guides are always welcome. They may be sent to the following address.

4-H Resource Development Subcommittee  
Ontario 4-H Council  
RR#1  
Thornloe, Ontario  
P0J 1S0  
1-800-937-5161

SUPPLIER	SUPPLIES AVAILABLE
Atkinson Maple Syrup Supplies, R.R. #1, Barrie, ON, L4M 4Y8, (705) 722-3331	Evaporators, reverse osmosis machines, tubing systems, used equipment and trade-ins, containers, labels and candy packaging (Free price list, mail order and delivery available.)
Camp Can-Aqua Maple Syrup and Suppliers, Box 70, Cardiff, ON, K0L 1M0, (613) 339-2969	Full line of supplies. Dominion and Grimm Evaporators, tubing and containers.
Curle's Maple Products and Supplies, Box 93, Campbellford, ON, K0L 1L0, (705) 653-2519	Full line of supplies. Lightning Evaporators, Natural Flow tubing, and reverse osmosis machines.
Donald Dodds, R.R. #2, Clayton, ON, K0A 1P0, (613) 256-4045	Waterloo Evaporators and Equipment. Tubing and supplies.
Dave Gardiner, Opeongo Maple Products, R.R. #4, Eganville, ON, K0J 1T0, (613) 754-2049	Full line of supplies. Evaporators, reverse osmosis, Piggy-Back pans, pumps, tubing, cans, bottles, jugs, labels. (Free price list available.)
Jakeman's Maple Products, R.R. #1, Beachville, ON, N0J 1A0, (519) 539-1366.	Full line of supplies. Small Brothers' evaporators, Maple Experts tubing, Travaini pumps, Canadian cans, reverse osmosis machines, used equipment, labels, candy packaging.
Peter Kidd, Kidd's Home Hardware, Sunridge, ON, P0A 1Z0, (705) 384-5344.	Dominion and Grimm evaporators and equipment; Natural Flow tubing; plastic, glass and metal containers. (Free listings to sell or buy equipment in their mailing list.)
Elmer Kuepfer Service and Supply, R.R. #1, Linwood, ON, N0B 2A0.	Diesel and gasoline engines, generating sets and chain saws.
Duncan MacArthur, Lancaster, Ontario. K0C 1N0, (613) 347-3472.	Full line of supplies. Dominion and Grimm and Waterloo Evaporators and Equipment, Travaini and Sihi pumps, Honda generators, I.P.L tubing systems, reverse osmosis machines, syrup containers, syrup drums, syrup filter presses, self-adhesive labels. (Bulk syrup buyer and shipper Lic. 3572.) (Sugar bush consultant and pipeline installer.) (Free price list available.)
McCullough Feed and Seed, P.O. Box 201, Hillier St., Lanark, ON, K0G 1K0, (613) 259-2167.	Full line of supplies, tubing, containers, etc...
McKay Sheet Metal, R.R. #2, Lanark, ON, K0G 1K0, (613) 259-5766.	Custom made S/S pans, fill tanks, galvanized tanks, storage tanks and smoke stacks.
Merriman Farm Supplies, R.R. #1, Elgin, ON, K0G 1E0, (613) 272-2755.	Small Brothers' maple syrup equipment (new and used), syrup containers.
Paul's Maple Products, R.R. #3, Lanark, ON, K0G 1K0, (613) 259-5276.	Full line of supplies. Lightning and Dominion and Grimm evaporators and equipment, Lamb Natural Flow tubing, packaging and containers.
Richards Packaging Inc., 3115 Lenworth Drive, Mississauga, ON, L4X 2G5, (416) 939-7950.	Glass containers and caps, plastic bottles, plastic pails.

<p>Robson-Smith Sugar Bush Supplies Inc., R.R. #3, Schomberg, ON, L0G 1T0, (416) 939-7950.</p>	<p>Full line of supplies. Waterloo, Small Brothers' and Dominion and Grimm evaporators; Lamb tubing systems and their own green tubing; orange Canadian syrup cans (125 mL to 4 L); reverse osmosis; and vacuum systems.</p>
<p>Reist Welding Ltd., R.R. #2, Elmira, ON, N3B 2Z2, (519) 669-1501.</p>	<p>Full line of supplies. Made to order evaporators and storage tanks, new and used buckets and tanks, tubing systems, containers. Dominion and Grimm equipment. (Repairs to equipment.)</p>
<p>Sanders Maple Products, R.R. #1, Finch, ON. K0C 1K0, (613) 984-2368.</p>	<p>Full line of supplies. Dominion and Grimm equipment, Lamb tubing systems, vacuums pumps, reverse osmosis machines, filter presses, evaporators, syrup drums, syrup containers. (Catalog available.)</p>
<p>Seprotech Systems Inc., 2378 Holly Lane, Ottawa, ON, K1G 7P1, (613) 523-1641.</p>	<p>Reverse osmosis equipment and service.</p>
<p>Shearer's Maple Products, R.R. #1, Desboro, ON, N0H 1K0, (519) 363-3392.</p>	<p>Lightning and Dominion and Grimm Equipment; Maple Experts, Lamb, and IPL tubing, fittings, and mainlines; Travaini vacuum pumps; containers; drums; used equipment; and repairs. (Sugar bush consultations available.)</p>
<p>Kennedy's Sugar Bush and Maple Supplies, R.R. #2, Millbrook, ON, LOA 1G0, (705) 932-2653.</p>	<p>Full line of supplies. Waterloo evaporators, Seprotech reverse osmosis machines, tubing, containers, custom printed labels. (Free price list available.)</p>
<p>Peter Stransky, Box 1, Collingwood, ON, L9Y 3Z4, (705) 445-4468 or (705) 445-6871.</p>	<p>Full line of supplies. Lightning evaporators and equipment, tubing, containers, reverse osmosis, used equipment and bulk syrup. (Local agents throughout the maple belt.)</p>
<p>Eli Weber, Box 137, Heidelberg, ON, N0B 1A0.</p>	<p>Full line of supplies. Dominion and Grimm evaporators, tubing systems.</p>

# Kids Help Phone

At the bottom of the table of contents page in the Members' Manual you will see the Kids Help Phone logo and number. Kids Help Phone is available to over 7 million children and teenagers throughout Canada.

It is a national, bilingual, confidential, toll free helpline staffed by paid, trained professionals. In response to the problems and concerns of our youth, Kids Help Phone provides a listening ear, emotional support, counselling, information and referrals. Children and teens from anywhere in Canada can call anonymously 24 hours a day, 365 days a year.

Children and teens can call about anything that is bothering them including – abuse; drugs; alcohol; conflicts with parents, friends or teachers; pregnancy; sexuality; suicide; or parental separation and divorce.

Please mention this number to your members and explain what it is for. Make sure they know that it is free and they don't have to give a name or address.



*The Kids Help Phone gets 1000 calls a day... 2000 more get a busy signal. If you or your club or someone you know would like to make a donation to the Kids Help Phone, call 1-800-268-3062.*



# Meeting 1

# Healthy Trees Make Happy Forests!

## Objectives

1. To welcome members.
2. To introduce the project and its requirements.
3. To practise parliamentary procedure and elect the club executive.
4. To become familiar with the factors a person should consider when choosing a future sugar bush or expanding an existing bush.
5. To learn about enemies of the sugar bush and how to deal with them.

## Special Notes For This Meeting

### Guest

For the "Who Done It?" Tour, you might want to invite a maple syrup producer, your local Master Gardener, a horticultural society member or someone else with knowledge about stressed trees to help you with the tour.

### Location and Time

The "Who Done It?" Tour must be done in daylight hours. If you plan to do this activity, schedule the meeting accordingly.

## In A Nutshell

Welcome and Get Acquainted	up to 10 min.
Getting Started	15 min.
A Road Map to Good Meetings	15 min.
Roll Call	5 min.
Choosing a Sugar Bush	25 min.
Enemies of the Sugar Bush	30 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<hr/> 105 min.

## Preparation & Equipment

Depending on the selection of activities, you and/or a Youth Leader should prepare the following.

### Get Acquainted Activity

- Photocopy and cut out pictures on page 20 of this guide and bring tape or safety pins to put pictures on members' backs.

## Getting Started

- Post a copy of the 4-H pledge.
- **Supplies:** name tags (optional), membership list, "4-H Club Member Lives Here" and "4-H Project" signs, Advanced Members' Manuals (one for each member).

## A Road Map to Good Meetings

- It might be helpful to review the 4-H Volunteers' Handbook and the OMAFRA Factsheet "Procedures for Meetings" (89-095) before the meeting.

## Choosing a Sugar Bush

- Make three copies of page 21, this guide.
- You will also need scrap paper and a watch or timer.

## Enemies of the Sugar Bush

- **Method A — Video**  
-Order video, have the VCR and TV ready and cue video
- **Method B — "Who Done It?" Tour**  
-Before the meeting, map out your route for the "Who Done It?" Tour. Make sure you will walk by some trees that have been stressed by one or more enemies. Review information in the Manual to help you through the tour.
- **Method C — Match the Enemy with the Impact**  
-Copy one enemy/impact sheet for every three members (page 22, this guide). Cut each page into 26 separate pieces and place the pieces into an envelope.

## Welcome And Get Acquainted (up to 10 minutes)

### What Am I?

This game is related to the maple syrup theme and can lead into a summary of what the club covers.

Use the picture sheet provided on page 20, this guide. Tape one picture on the back of each club member. Don't let them peek. You may want to give harder pictures to older members. Tell them that the theme of the pictures is maple sugaring. The object of the game is for the 4-H member to find out what his or her picture is by asking questions with either a yes or no answer (eg. Is it living? Can you eat it? Does it move? Does it have hair?). Give members about 7 minutes to see if they can identify their picture. When the 4-H member guesses the correct answer, he or she should shake hands and introduce him or herself to the member who confirms his or her correct guess. All members can continue to answer questions even if they have guessed their own picture. If it seems to be taking too long, ask 4-H members to start giving hints.

## Getting Started (15 minutes)

1. Begin with the 4-H pledge.
2. Welcome the members. Introduce the leaders. Have members introduce themselves. Introduce the youth leader if this has been decided. Ensure that everyone has a name tag (optional).
3. Complete membership list.
4. Outline opportunities available such as taking part in local fairs, 4-H Go For the Gold, 4-H Members' Conference, etc.
5. Distribute "4-H Club Member Lives Here" and "4-H Project" signs, if available.
6. Distribute the Advanced Members' Manuals.
7. Give a brief summary of the topics covered in the club. (If you do the suggested "Get Acquainted Activity," use the pictures to help you summarize what the club covers.)
8. Discuss the members' requirements for the project. See page 1. Outline any expectations you have of the members.
9. Briefly discuss the Achievement Program possibilities.

## A Road Map To Good Meetings (15 minutes)

It is important for everyone to become familiar with the basics of running a good meeting. Review with members the purpose of an agenda and the executive's responsibilities. Have the club members elect an executive. You may find the 4-H Volunteers' Handbook and the OMAFRA Factsheet "Procedures for Meetings" (89-095) helpful.

## Roll Call (5 minutes) page 4

Ask each member to answer the roll call.

## Choosing A Sugar Bush (25 minutes) page 4

### Brainstorming Session

Ask members what things they would want to consider if they had to choose a sugar bush from among 2 or 3 woodlots. How would they decide which woodlot was best? If members can't think of anything, lead them to the answers by asking them questions. You can refer the group to the Members' Manual once they have brainstormed some of their own ideas. Members can use this list to help with their debate.

### Woodlot Debate

1. Break members into three groups by counting 1, 2, 3. Give each group a copy of all three woodlot descriptions. Also, give each group a piece of scrap paper for writing notes. Assign each group to one woodlot.

2. Explain the debating format. Their objective is to argue that their woodlot would make the best sugar bush. Each group will be given two uninterrupted minutes to present its arguments. Then, each group will be given one minute for a rebuttal. A rebuttal is a response or reply to what the other groups have said. Then, the debate is over. Remind members to pay close attention because they will vote for the best woodlot when the debate is complete.
3. Give the groups 5 to 10 minutes to prepare their arguments. Circulate amongst the groups while they prepare. Encourage them to decide if the presentation will be made by one group member or all of them. This decision should be left up to each group.
4. Hold the debate and rebuttals.
5. Then, get members to write their woodlot choice (one, two, or three) on a piece of paper and give it to the leader. The leader will count the votes to see which is the most popular choice. Woodlot three is probably the best overall choice, but it could be argued that the flat nature of woodlot one is better for bucket operators. Briefly review the choice in terms of things to think about when choosing a sugar bush.

## Enemies Of The Sugar Bush

(30 minutes) page 4

Before you begin, ask the group to help you make a list of all the things that might stress a sugar bush (weaken it, slow its growth, kill some trees, etc.). Write down everything members suggest. If they produce enough ideas, see if they can put the ideas into groups or under headings. This should get them thinking about sugar bush enemies. Then, you can do one of the alternative activities.

NOTE: If you choose Method A or B, your group might still enjoy the matching activity in Method C.

## Alternative Activities:

### Method A — Video

"Maple Sugar Bush Management" is a 35 minute VHS video produced by the University of Guelph. This video covers woodlot management, enemies of the sugar bush and soil conditions. Due to its length, it's suggested you only show the segment of the video on sugar bush enemies (insects and disease). The video can be obtained from:

A.V. Library, Visual Communications Services, OMAFRA, 52 Royal Road, Guelph, Ontario N1H 1G3, (519) 767-3622, fax (519) 824-9521.

Before starting the tape, ask members to pay particular attention to different enemies and the problems that these enemies can cause. After members watch the video, answer any questions they might have. Discuss how they would tell if a tree was healthy and what signs they would look for to tell if a tree was stressed.

#### **Method B — "Who Done It?" Tour**

Take your club on a tour of a yard, neighbourhood, park or bush. (Always ask permission to go on private property.) Tell your club that it is going to act as a tree specialist team. Their job is to look for signs of unhealthy or damaged trees. When they find such a tree, ask members to guess what caused the damage. (eg. What enemies could cause the tree trunk to split? What does the growth of mushrooms or fungus on a tree indicate?) Discuss ways the enemies could be avoided or dealt with.

#### **Method C — Match The Enemy With The Impact**

Break members into groups of three. Give each group an envelope containing the cut up enemy/impact sheet. Tell the groups that each description of damage can be matched with an enemy. Their job is to match them up. Ask members to raise their hands when they think they have got all of the matches. You should tell them which matches are right. Then members are given a chance to rearrange the remaining ones in the correct order. Keep doing this until every group is finished. If the groups are having a lot of difficulty, let them use their manuals for assistance. Afterwards, discuss how a sugar bush producer could avoid or deal with these enemies.

## **Wrapping It Up**

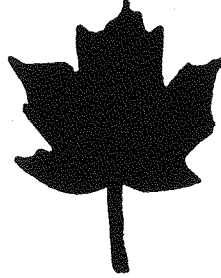
1. Have members briefly summarize what they learned at this meeting.
2. Review the "Before the Next Meeting" section (page 7).
3. Remind members to wear appropriate clothing if the club is going to a sugar bush or woodlot next meeting.
4. Remind members to think about what they'd like to do for an achievement program. A decision will be made about it next meeting.

# What Am I?

**maple syrup farmer**



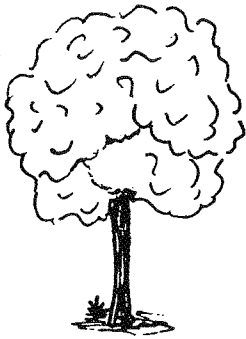
**maple leaf**



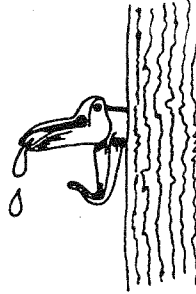
**sugar bush**



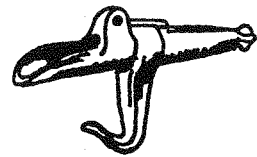
**maple tree**



**sap**



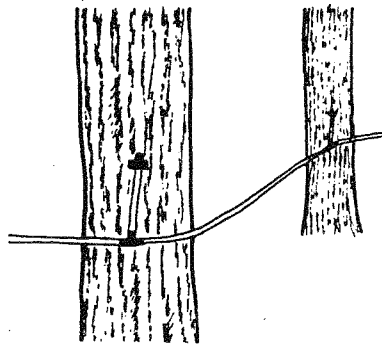
**spile**



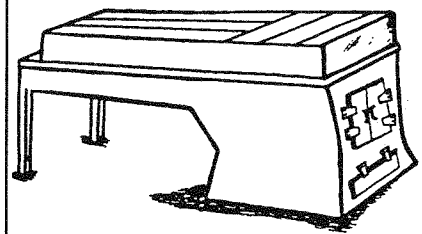
**bucket or pail**



**tubing or pipeline**



**evaporator**



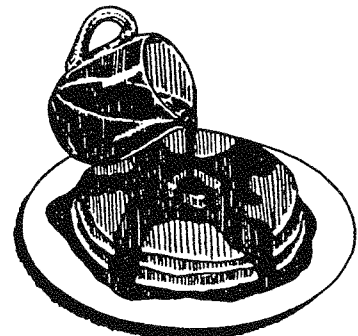
**maple syrup**



**maple syrup festival**



**pancakes**



## **Woodlot Descriptions for Debate**

### **WOODLOT ONE**

To get to this woodlot you have to drive for about two minutes and then go down a short lane from the road. The land has a few gentle slopes but is flat in most places. The soil is neither deep or shallow. The soil drains slowly.

### **WOODLOT TWO**

This woodlot is right beside your existing sugar bush. The land slopes steeply towards the west. The soil drains well but is shallow in spots.

### **WOODLOT THREE**

To get to this woodlot, you have to drive for about five minutes and then follow a long lane down one side of a cornfield. The land slopes gently towards the east. The tree roots grow in deep soil.

## Match The Enemy With The Impact!

Broken or torn branches

High Winds

Tree trunks split after surrounding trees are cut down

Sunscald

Shrivelled, black leaves and shoots on young trees in the late spring

Late Spring Frost

Only the veins or skeletons of the leaves remain

Saddled Prominent

All the leaves on a tree disappear in the late spring and early summer

Forest Tent Caterpillar

The sapwood layer of the tree has small tunnels in it and the outer bark is cracked and falling off

Sugar Maple Borer

Dark brown spots on leaves in cool, wet weather

Leaf Disease

Build-up of deformed bark and wood on a branch or trunk

Canker

Conks or mushrooms growing around or on a tree

Internal Decay

The bark around the base of a young maple has disappeared

Mice or Porcupines

There are only a few young trees growing up to replace old ones

Grazing Cattle

The roots and trunk of a tree have chunks knocked out of them or scrapes

Tractors in the Bush

Trees are growing slowly

Air Pollution



# Meeting 2

# Woodlot Wise

## Objectives

1. To understand why you need to thin a sugar bush.
2. To learn how to select crop trees and trees to remove.
3. To learn how to mark trees in a sugar bush.
4. To realize the importance of sap sweetness and how to measure it.
5. To understand what the taphole yield factor means.
6. To decide on what the club will do for its Achievement Program.

## Special Notes For This Meeting

### Location and Time

Some of the activities in this meeting would best be carried out in a woodlot. However, certain activities depend on the time of year your club is doing the project. Selecting crop trees and trees to remove is best done when the trees are in leaf (late spring or summer). It is best to measure sap sweetness in the spring when the sap is flowing. If your club cannot do the activities in the woodlot, because of the season or for some other reason, choose an alternate indoor activity. Remember that outdoor activities must be completed in the daylight. Schedule your meeting accordingly.

### Special Guest

If your club is able to go to the woodlot and carry out the suggested outdoor activities, it might be a good idea to invite someone who is knowledgeable about woodlot management. A maple syrup producer would likely be a good resource.

## In A Nutshell

### Outdoor Meeting:

Roll Call	5 min.
Thinning and Improving The Woodlot	15 min.
Selecting And Marking Crop Trees And Trees To Cut Down	35 min.
Measuring Sap Sweetness (only in spring)	35 min.
Taphole Yield Factor (indoor)	10 min.
Achievement Program Discussion	15 min.
Wrapping It Up	5 min.

TOTAL

---

120 min.

### Indoor Meeting:

Roll Call	5 min.
Thinning And Improving The Woodlot	10 min.
Woodlot Model	30 min.
Taphole Yield Factor	10 min.
Woodlot Wisdom Game	20 min.
Achievement Program Discussion	15 min.
Wrapping It Up	5 min.
TOTAL	<hr/> 95 min.

## Preparation And Equipment

### Thinning and Improving The Woodlot (O, I)

- 0 = Outdoor Activity, I = Indoor Activity
- Outdoors: Before the meeting, find a thinned and an unthinned woodlot. Try to find ones that are within close driving distance to each other. Ask permission to tour the woodlots.
- Indoors: You will need masking tape, a chalk board and chalk or chart paper and markers.

### Selecting And Marking Crop Trees And Trees To Cut Down (O)

- You will need:
  - unthinned woodlot;
  - blue and yellow tree marking paint (or two different colours of plastic ribbon to tie around trees).

### Measuring Sap Sweetness (O)

- You will need:
  - thermometer to check air temperature, refractometer, a few small nails (at least 6 cm, 2.5 inches long), hammer, toothpicks or hypodermic needle, rubbing alcohol and soft tissues, and a temperature correction table (page 34, this guide).

### Woodlot Model (I)

- You will need:
  - a large box (eg. 80 cm x 50 cm) with the top and three sides cut out;
  - twigs from different types of trees and different sizes;
  - Plasticine to make twigs stand up;
  - construction paper or tissue paper (green and brown are most important);
  - liquid tempera paint (red, yellow, white and blue) ;
  - small paint brushes or toothpicks to mark trees;
  - glue.

### Taphole Yield Factor (O,I)

- You will need:  
-one copy of page 31 of this guide for every three members and several calculators (optional).

### Woodlot Wisdom Game (I)

- You will need:  
-copies of playing board and dice (one for every three members) and coloured buttons for game markers.

## Roll Call

(5 minutes) page 8

Ask each member to answer the roll call.

## Thinning And Improving The Woodlot

page 8

**Outdoors** (15 minutes – not including travel time between woodlots)

The best way to understand why a woodlot should be thinned is to tour an unthinned woodlot and compare it to a thinned one. This could be done at any time of year, but the late spring or summer would be best. Invite members to examine the trees. Ask them to notice how tall the trees are, how wide the trunks are, the shape and size of the crowns (leafy tops), how close the crowns are to the ground, etc. You will find that an overcrowded, unthinned woodlot will have very tall, thin trees with small crowns. A thinned woodlot will have shorter trees with large, well-developed crowns. Once members have examined both types of lots, ask them to compare the two. Discuss the importance of large leafy tops for making sugar which will later be made into maple syrup.

**Indoor** (10 minutes)

Tape a square on the floor with sides about 1 m long. Tell members that the square represents a small part of a woodlot. Ask for 4 or 5 volunteers to portray trees. The "trees" should stand inside the square. Invite the participants to stretch their arms out wide to catch the sun. Explain that they need more sun. Tell them to stretch taller. Ask them the following questions: Do they feel crowded, are they getting enough water, nutrients or sun? Do they think they would grow better if they were in a square by themselves?

Ask for a volunteer to be a forester. Explain that the forester is coming to thin the woodlot. The forester should be instructed to pretend to chop down all but two of the "trees." The other "trees" will return to the group. Ask the remaining "trees" how they are feeling now. Invite them to stretch their arms out wide to represent the extra room they have to grow.

After the demonstration, ask the spectators why they think a maple syrup producer would want to thin the sugar bush. Stress that thinning the bush allows the remaining trees to grow large, leafy tops which produce lots of sugar for maple syrup. Unthinned, crowded woodlots develop tall, skinny trees. These trees keep reaching upwards for sunlight, but they can't grow sideways because they are too crowded. To further illustrate this concept, draw a picture of both a thinned and unthinned woodlot on a blackboard or chart paper.

## Selecting And Marking Crop Trees And Trees To Cut Down

(35 minutes) pages 9-10

### Outdoors

As mentioned in "Special Notes for This Meeting," this activity is best done in the late spring or summer when the trees are in leaf. While you are at the unthinned woodlot, take the time to show how to select crop trees.

1. Pick out a good crop tree. Tell members about the features that make it a good tree (page 8). Then, pick out several trees that would not make good crop trees. Explain why. This should give them a good idea of what they should and should not be looking for.
2. Then, you can take the group through the steps of selecting and spacing the crop trees in the woodlot. Use the instructions on page 9 to guide you. If the woodlot owner has granted you permission, you might even mark the trees with blue tree marking paint (see the instructions on page 11). Otherwise, tie ribbons around the selected crop trees. You don't need to mark the whole bush! Try marking 5 to 10 trees. This should be enough to help members understand the process.
3. Use another colour of ribbon or paint to mark the trees that members think should be cut down. Discuss which trees should be cut down and why. Use the information on page 10 to guide you. Stress that it is important not to overthin a woodlot because it can cause sunscald (see page 7). Marking 5 to 10 trees should be enough.

## Measuring Sap Sweetness

(35 minutes) page 11

### Outdoor

As mentioned in "Special Notes for This Meeting," this activity is best done in the spring when the sap is flowing. First, you should discuss what sap sweetness is and its importance (see page 12). Then, follow the instructions in the Members' Manual (page 11) to show how to measure the sugar

content of sap. Instructions for using a refractometer are in the Members' Manual as well (page 19). Let each member measure the sap sweetness of one tree. Challenge them to find the sweetest tree in the area by using their knowledge of the features of a healthy tree. You likely will be able to get only one refractometer, so members will have to wait their turn. (See the Social Recreation Ideas below.)

Another option is to let members test some sap which has dripped into buckets from tapped trees. They can use a hydrometer for this. See page 19 of the General Members' Manual for instructions on how to use a hydrometer.

### **Social Recreation Ideas**

While waiting to measure sap sweetness, they can play a game.

**Loose Caboose:** Form trains by having players line up in groups of three, one behind the other, holding one another around the waist or arms. The first in line is the "engine," the next the "coal car" and the last the "caboose." One or more players are the Loose Cabooses. They try to catch on the end of the various trains. When a caboose is successful, the "engine" of the group goes off to become the loose caboose.

**Knots:** To form the knot, up to a dozen players stand in a circle shoulder to shoulder. Everyone places his or her hands in the centre and grabs two other hands (each from a different person). One person on the outside gives guidance to the group as to how to untie their knot.

**On the Spot Scavenger Hunt:** Divide members into two teams. Each team chooses a captain or a runner. You should call out the name of an object you wish the teams to find (eg. maple leaf, black shoelace, gum wrapper, etc.) Each team then attempts to find the object and present it to you first. The runner is the only one who may give the object to the leader.

## **Woodlot Model**

(30 minutes)

### **Indoor**

Throughout this activity, use the information in the Members' Manual to support you. You should lead members in the activity and let them do the actual selection and marking of trees (twigs).

1. Instruct members to cut the top and three sides off of the box so that they can see in from one side and the top.

2. Using the features of good crop trees and trees to remove (page 8), discuss the types of trees that members can make. Then, demonstrate how members can make standing trees by sticking twigs into a piece of Plasticine. Show how they can add tissue paper or construction paper leaves (using green for healthy trees and brown, or no leaves, for unhealthy trees). Encourage members to make a variety of trees (small, large, ones with broken limbs or tops that are knocked off, diseased, etc.). Use construction paper to make fungus or mushrooms growing from the trees. Also encourage members to include a couple of evergreen trees/twigs!
3. Have members place their trees in the box. They should space some close together and others far apart. Encourage them to mix up the size and kind of tree throughout their woodlot replica.
4. Demonstrate how members can use red paint to mark the boundaries of the sugar bush (page 11). Invite members to mark the boundaries of the woodlot.
5. Now, show the group how to thin the woodlot. Pretend to choose crop trees. Follow the instructions on page 9 but modify them for the woodlot replica (eg. instead of walking 6 m try walking 12 cm). Ask members to mark the crop trees with blue paint (see page 11).
6. When the crop trees are all marked, you can demonstrate how to choose trees that should be cut down. Explain that trees crowding the crop trees should be removed first. Then, other trees can be removed. Have members mark the trees to cut down with a spot of yellow paint (see page 11). Remind members not to overthin! They won't want their crop trees to be scalded by the sun.
7. Show members how they can use white paint to mark the proper number of taps (see page 11). For the proper number of taps, have them mark the thickest crop trees with two or three dots and the thinnest ones with one dot.
8. Don't throw out the woodlot replica. If you are doing the next meeting indoors, you will use the replica for setting up a tubing system. You can also display the replica at your Achievement Program and/or enter it in a local fair.

## Taphole Yield Factor

(10 minutes) page 12

Break members into groups of three. Have the three members that travelled the furthest to the meeting form one group and the three people that travelled the shortest distance form another group and so on.

Give the groups one copy of the problem found on page 31 of this guide. Give the participants five minutes to brainstorm how they would choose between the four farms.

Then, ask the groups how they decided which farm to buy. Some groups may choose farm four because it produces the most syrup. Other groups may choose farm one because it has the most tapholes. However, the best answer is to find the farm which produces the most syrup with the fewest tapholes. If a group suggests this last option, have them explain and show (on a large piece of paper) how they would do this.

Explain the taphole yield factor and how to figure it out (see page 12). Stress that the lower the factor, the better. Let the groups use calculators (if they want) to figure out the yield factors for the four farms and choose the best farm. The answers are provided below for you.

Farm One: Yield Factor = 1.0

Farm Two: Yield Factor = 0.5

Farm Three: Yield Factor = 1.5

Farm Four: Yield Factor = 2.0

Thus, the best choice is farm two. Two litres of syrup are produced at this farm from just one taphole.

## Woodlot Wisdom Game

(20 minutes)

### Indoor

1. Break members into groups of three. Break them up according birth months. First, have all members born in the first six months go to one side of the room and the rest go to the other side. Then, keep breaking the groups apart until you have three members to a group. You might end up with one group with 2 players or one group with 4 players and that is fine.
2. Give each group a playing board and 1 die. Have each member pick a coloured button for his or her marker.
3. Explain that the object of the game is to be the first person to reach the finish. This proves the person is woodlot wise (or lucky)! Tell members to move their

markers according to what they roll on the die and what the squares tell them to do. Encourage participants to read the squares aloud so everyone learns while they play. Recommend that members consult their manuals if none of the players knows the correct answer to a question. Tell them that the person who rolls the highest number goes first.

4. Let the games begin. It should take a maximum of 20 minutes to complete the game.
5. If groups finish quickly, have members move to different groups and play again.

## **Achievement Program Discussion**

(15 minutes)

Review the Achievement Program ideas (page 5, this guide). Ask members to share additional ideas. Vote on the options. Take this time to begin to discuss the details of the program.

## **Wrapping It Up**

(5 minutes)

1. Have 4-H members briefly summarize what they learned at this meeting.
2. Review the "Before the Next Meeting" activity (page 12).
3. Remind 4-H members to wear appropriate clothing if the club is going to a sugar bush or woodlot next meeting.



## Which Farm is the Best Choice?

You have been looking to buy a maple syrup farm. There are four farms close to your home. All you know about the farms is the number of tapholes per hectare and how much syrup the farm produces per hectare each season. How would you decide which farm to buy?

**Farm One** has 125 tapholes per hectare and produces 125 litres of syrup per hectare each year.

**Farm Two** has 75 tapholes per hectare and produces 150 litres of syrup per hectare each year.

**Farm Three** has 72 tapholes per hectare and produces 48 litres of syrup per hectare each year.

**Farm Four** has 120 tapholes per hectare and produces 60 litres of syrup per hectare each year.

# WOODLOT

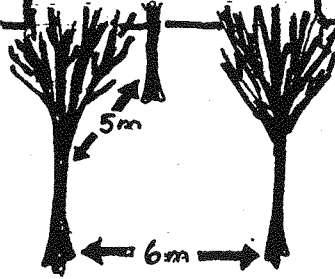
**START**

What is better? A low or a high taphole yield factor? Go ahead 3 spaces if the other players agree with you.

You marked your woodlot. There is a crop tree about every 6 meters. Great! Go ahead 2 spaces.

You didn't thin your sugar bush. Now you have tall thin maple trees. Go back to "Start"!

Way to go! You called the Ministry of Natural Resources office for advice on marking crop trees. Go ahead 2 spaces.



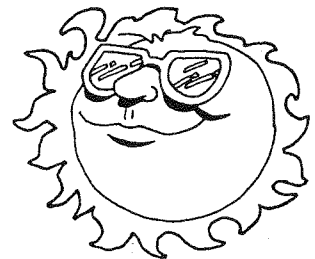
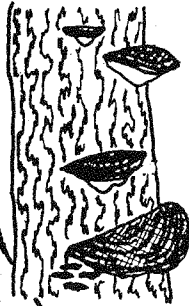
High winds hit your bush! Go to the shed and get your chainsaw. You've got some work to do!

What colour of paint should you put on trees you want to cut down? Go ahead 2 spaces if the other players agree with you.

Oh, No! You cut down your wind-break. Go back to the shed.



Oh, No! You didn't cut down a diseased tree. The disease has spread to other trees. Go to the shed and get your chainsaw.



Which is better? Sap with 3% sugar or sap with 1% sugar. Go ahead one space if the other players agree with you.

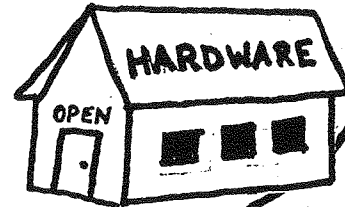
You cut down 3 old trees to let the sunlight reach the seedlings below. Good work! Get another turn.

# WISDOM



Great, you picked healthy crop trees with large leafy tops. Jump ahead 2 spaces.

You've had hardly any rain this summer. Your trees are thirsty. Wait 1 turn while it rains.

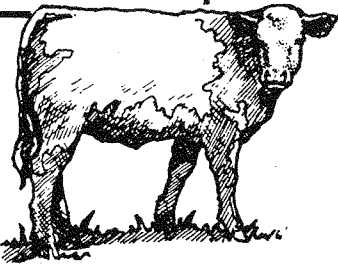


Name one thing you would look for in a good crop tree. If the other players agree, then go ahead 4 spaces.

Bad Move! You let your cows in the bush. Go to the hardware store for a fence to keep the cows out.

Name something that can damage a tree. If the other players agree, then go ahead 3 spaces.

You chose a crop tree that wasn't a maple. How embarrassing! Learn how to identify trees. Go to the library.



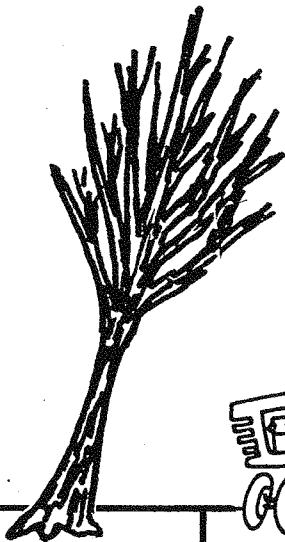
**YOU'RE WOODLOT WISE!**



What colour of paint should you use to mark crop trees? Go ahead 2 space if the other players agree with you.



Forest tent caterpillar attacked your bush. Wait one turn while your trees get back to health.



Well done! You cut down a leaning tree so it didn't fall on healthy ones. Jump ahead 2 spaces.



Your tractor damaged the bark on two trees. Go back 3 spaces.

Table 2. Corrections to Apply to Observed Brix Readings of Maple Syrup to compensate for Effects of Temperature

Temperature of syrup in Hydrometer cup or on Refractometer in degrees Celcius (°C) and degrees Fahrenheit (°F)		Corrections to Subtract from (-) or Add to (+) Observed Brix Reading
°C	°F	Correction
0	32	-1.4
2	36	-1.3
4	39	-1.2
6	43	-1.1
8	46	-1.0
10	50	-0.8
11	52	-0.7
12	54	-0.6
13	55	-0.5
14	57	-0.4
15	59	-0.4
16	61	-0.3
17	63	-0.2
18	64	-0.1
19	66	-0.1
20	68	0
21	70	+0.2
22	72	+0.3
23	73	+0.3
24	75	+0.3
25	77	+0.4
26	79	+0.5
27	81	+0.5
28	82	+0.7
29	84	+0.8
30	86	+0.9
31	88	+0.9
32	90	+1.0
33	91	+1.1
34	93	+1.1
35	95	+1.2
36	97	+1.3
37	99	+1.3
38	100	+1.5
39	102	+1.6
40	104	+1.7
41	106	+1.7
42	108	+1.8
43	109	+1.9
44	112	+2.0
45	113	+2.1
46	115	+2.2
47	117	+2.3
48	118	+2.3
49	120	+2.4
50	122	+2.5
52	125	+2.7
54	130	+3.0
56	133	+3.2
58	136	+3.3
60	140	+3.5
62	144	+3.7
64	147	+3.9
66	150	+4.1
68	155	+4.4
70	158	+4.6
72	162	+4.8
74	165	+5.0
76	169	+5.3
78	172	+5.7
80	176	+5.9

\*Most hydrometers and refractometers are calibrated at exactly 20°C.

Table taken from:  
 Agdex 310/70, Order #89-111  
Maple Syrup: Measuring Density

# Meeting 3

# Producers Kick The Bucket!

## Objectives

1. To learn how to set up a tubing system.
2. To understand the methods of moving sap through tubing.
3. To learn how to clean and mark tubing systems.
4. To realize the importance of storing sap properly and processing it promptly.

## Special Notes For This Meeting

### Location and Time

A tour of a sugar bush with a tubing system is probably the best way to learn about the tubing collection method. Remember, the tour would have to be completed in the daylight. Schedule your meeting accordingly.

### Special Guest

If you're doing a tour, invite the producer to come along or guide it. He or she will know the bush and equipment best.

## In A Nutshell

### Outdoor:

Roll Call	5 min.
Tour	45 min.
Mapping the Sugar Bush	30 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<b>85 min.</b>

### Indoor:

Roll Call	5 min.
Slide Presentation	10 min.
Woodlot Model	30 min.
Mapping the Sugar Bush	20 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<b>70 min.</b>

## Preparation And Equipment

Tour (O)

- O = Outdoors, I = Indoors.
- Before the meeting, arrange a trip to a sugar bush with tubing. If possible, ask the producer to give the tour.

Slide Presentation (I)

- If you are going to mark trees and tubing, you will need tree paint and markers.
- Before the meeting, order the slides, projector and screen. Set up the projector and slides.

Woodlot Model (I)

- You will need:
  - model of woodlot constructed last meeting or have members make a model at this meeting (see instructions on page 27, this guide);
  - something to represent tubing (eg. 3 different colours of yarn, or pipe cleaners or wires with a plastic coating);
  - odds and ends to make a vacuum pump, storage tank, sugar shanty (eg. cardboard, construction paper, popsicle sticks, aluminum foil, toilet paper rolls, glue, etc.);
  - liquid tempera paint;
  - small paint brushes or toothpicks to mark the trees;
  - paper to make tags for the tubing;
  - needles and thread to hang tags.

Mapping the Sugar Bush (O)

- You will need:
  - blank white paper (at least enough for one sheet for each member), pencils, erasers and pencil crayons (optional).

## Roll Call

(5 minutes) page 13

Ask each member to answer the roll call.

## Tour

(45 minutes)

### Outdoor

Touring a sugar bush with a tubing system will help your members understand how tubing systems work. Encourage them to ask questions while you tour the bush.

First, you should find a tree in the sugar bush at which to start. Follow the tubing maze from the tree to the storage tank. As you walk, point out the different parts of the tubing system (page 13). Note the size of the tubing and the type of material of which it is made. Ask the members why the main line would need to be bigger? You can also discuss how the tubing is set up in the spring (page 14). For instance, you should explain which lines would be set out first, then second and so on. Also look for things to avoid in tubing systems (page 14). For example if you find a U-shaped dropline, discuss why this would interfere with the pull of gravity. If the system is vented, show the vents. Discuss the difference between a vented and closed system (page 14). If the sap is

pulled through the tubing by gravity, note how the tubing is set up so that the sap can run downwards (page 15). If the sap is moved with a vacuum pump, examine the pump and discuss how it works (page 15). Explain the difference between a Wet Pump System and a Dry Pump System. Discuss the benefits of vacuum pumps as compared to buckets or gravity (page 15). When you arrive at the storage tank, you should examine it. Note the material it is made of and where it is placed (shaded area). Stress the importance of keeping the sap cool and processing it quickly.

If the tubing and trees are marked so that the tubing can be put up year after year, note how they are marked (page 16). Ask the producer if members could mark some trees or tubing. The producer could supervise to make sure it is done as he or she would like.

Cleaning the tubing is an important part of the production process. If your club is doing this project in late April you might be lucky enough to help the farmer do his or her spring cleaning. A farmer might be willing to show you how to clean the lines at another time of year – just ask. If the farmer owns a tubing washer, ask if your club can see it work. Regardless, you should explain that the tubing must be cleaned and that it can be left in the sugar bush or stored until the following season (page 16).

## Slide Presentation

(10 minutes)

### Indoor

Ontario Maple Syrup contains slides on sap collection (buckets and tubing). There are 75 slides with a script. Slides 26-32 and 35-50 are most relevant to this meeting. You can show slides 33 and 34, about germicidal pellets, but stress they're no longer used because they've been related to tree decay.

The slides can be ordered from:

A.V. Library, Visual Communications Services, OMAFRA, 52 Royal Road, Guelph, Ontario N1H 1G3, (519) 767-3622, fax (519) 824-9521.

Before the meeting, make sure you're familiar with the slide projector. You might want to go through a test run just to be sure. You can read the script that goes with the slides or write your own if you like. Stop throughout the presentation to answer questions or explain something further. Ask members questions too! Get them involved.

## Woodlot Model

(30 minutes)

### Indoor

The purpose of this activity is to learn how to set up a tubing system using a woodlot model. If your club constructed a woodlot model in meeting two, you can begin this activity. If not, build one first (see instructions on page 27, this guide).

First, show members how to represent a tubing system using different colours of yarn, wire or pipe cleaners for each type of line (drop, lateral and main). Recommend that they use the thickest yarn for the main line to represent its larger size (or wrap two or three strands of yarn together). Suggest that they tie or twist the lines together to connect them. Explain that real tubing has special connectors to join the tubes.

Before members begin to set out the lines, have them decide where their sugar shanty and storage tank will be. Then, they can set the lines out as a producer would (eg. main line first, lateral lines next, etc.) (see page 14). Encourage the members to set up the "tubing" so that it slopes toward the storage tank. Discuss how gravity works and why the tubing should be set up so the sap can flow downwards. Point out things that the participants should avoid when setting up the tubing (page 14).

Next, have the group decide whether a vacuum system would be good for their farm and what kind of system they want (see page 15). Ask two members to design and make the vacuum pump. Invite two other members to make a storage tank and two other members to make a sugar shanty.

By this time, the participants might be getting more ideas about what they want in their bush (eg. roads or paths, a stream, a naughty squirrel chewing on the tubing, a person with a drill, an evaporator in the sugar shanty). Encourage them to make this an original model.

Finally, you can show the group how to mark the tubing system and trees. Explain why tubing systems need to be marked (see page 16). Use small pieces of paper with letters written on them as tags for the lines. String a needle and thread through the paper. Then tie the tag onto the tubing with the thread. Use a small paint brush (or toothpick) and some tempera paint to mark the trees.

Now, you have a replica of a sugar bush with a tubing system. Display the club's model at the achievement program and



consider entering it in a local fair.

## Mapping The Sugar Bush

(20-30 minutes)

For this activity, members will map an actual sugar bush or their woodlot model.

Before beginning you should discuss mapping strategies briefly. For example, ask members how they could represent a tree on a map. Could they use different colours to represent different kinds of trees? Ask them to suggest how they could show which way is north. Ask members if they think it would be better to use a legend instead of labelling the objects directly and so on.

Give each 4-H member a sheet of plain white paper. Then ask them to try to draw a map of the sugar bush. They should include hills, streams, roads, the sugar shanty, the tubing system, etc. Remind members to pay close attention to distance. They should make things that are close together in the woodlot look close together on their map. This is harder than it seems and takes a lot of practice. For outdoor clubs, it is probably best if the participants focus on a main line and one lateral line, rather than trying to map the whole bush. Indoor clubs may find mapping the entire woodlot model more feasible.

## Wrapping It Up

(5 minutes)

1. Have 4-H members briefly summarize what they learned at this meeting.
2. Review the "Before the Next Meeting" activity (page 17).
3. Remind members to wear appropriate clothing if the club is going to a sugar bush next meeting.

# Meeting 4

# Bubbling Gold

## Objectives

1. To review the tree to table sequence of syrup production.
2. To practise using a refractometer to measure syrup density.
3. To become familiar with energy saving equipment used in the boiling stage.

## Special Notes For This Meeting

### Location and Speaker

It would be ideal if your club could visit one or more farms that use a sap preheater, a Piggy-Back Pan, a reverse osmosis machine or a forced draught system. Ask the syrup producer if he or she would explain the equipment and how it works. They will know the equipment best!

Another option is to visit an equipment supplier. See the names and addresses at the beginning of this guide. Ask the dealer to explain the equipment and how it works.

## In A Nutshell

Roll Call	5 min.
Syrup Production Sequence	10 min.
Video	25 min.
Using A Refractometer	20 min.
Designing a Game	30-55 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<b>95 - 120 min.</b>

## Preparation And Equipment

Depending on the selection of activities, you and/or a Youth Leader should prepare the following.

### Visit to Operating Farm

- Confirm date and time of your trip.
- Find out how much a bush cord of wood sells for. (This is a pile of wood 4 ft by 4 ft by 8 ft.)

### Visit to an Equipment Dealer

- Confirm date and time of your trip.

### Syrup Production Sequence

- Before the meeting make two copies of the sequence on page 42, this guide. Cut the sequence into separate sections. Don't include the numbers in the copied versions as they will give the sequence away. Then, place the sequences into two envelopes (one for each team).

## Video

- You will need to order the video, cue the tape and have the TV and VCR ready.

## Using A Refractometer

- Before the meeting you should prepare three small maple syrup samples with different densities. Remember, you only need a drop of syrup to make a refractometer reading. Thus, these syrup samples can be quite small. You can prepare the samples by boiling some syrup to different temperatures. Temperatures higher than 4°C above the boiling point of water will result in more dense syrup. Number the syrup samples (1, 2 and 3) for easy reference.
- You will also need: a refractometer, rubbing alcohol, cotton balls, a thermometer, a temperature correction table (page 34, this guide), and soft tissue paper.

## Designing a Game

- You will need: markers, scissors, tape, large sheets of paper or bristol board, paper fasteners (to make a spinner), dice, buttons, etc.
- Optional: Bring in some board games or mazes to give members an idea of what they can do.

## Field Trips

### Visit To Operating Farm

Go to one or more farms that use some of the new inventions in the boiling stage. You or the producer should explain how the new equipment works (page 20). It would be a good idea to review the parts of the evaporator and how it works too (General Members' Manual, page 17).

Since many of these inventions have been designed to save fuel and costs, it's a good idea to discuss fuel while you are at the sugar bush. Discuss what kind of fuel producers use (most use wood, some use oil, a few use gas). If the producer uses wood, have members build a bush cord of wood. A bush cord is a pile of wood 8 ft long, 4 ft high, and 4 ft wide. A bush cord will produce between 68 and 90 litres of maple syrup. Divide the cost of a bush cord of wood by a number between 68 and 90 to find the cost of wood fuel per litre of maple syrup. This will give members an idea of fuel costs.

### Visit To An Equipment Dealer

The equipment supplier will have a variety of equipment available. Focus on boiling equipment while you are there, but don't hesitate to examine other equipment (especially anything that is new to the industry). Explain the new inventions used

in the boiling stage and how they work. It would be a good idea to review the parts of the evaporator and how they work (General Members' Manual, page 17).

## Roll Call

(5 minutes) page 18

Ask each member to answer the roll call.

## Syrup Production Sequence

(10 minutes)

This activity is to help review the major steps in the process of making syrup. Split the club into two teams. Give each team an envelope with the cut up sequence inside. Challenge the teams to be the first to sort out the sequence. Each team gets three attempts to get the entire sequence in the right order. On the third attempt, give the group the right sequence.

1. Collect the sap.
2. Check the boiling point of water.  
Start a fire in the evaporator.
3. The liquid in the pan is clear and colourless.  
The liquid drips off a skimmer in separate drops.
4. Boil the sap.
5. The liquid "sheets" off a skimmer.  
The liquid is a golden colour.  
The temperature of the syrup is 4°C above the boiling point of water.
6. Check the density of the syrup.
7. Filter the syrup.
8. Grade the syrup.
9. Can the syrup.
10. Sell the syrup to a customer or pour it over your own pancakes.

## Video

(25 minutes)

If you are not able to go to a farm or equipment supplier, show the members a video. Maple Syrup Production is a 22 minute VHS video produced by the University of Guelph. This video shows three syrup operations, a sap preheater and a reverse osmosis machine. The video can be obtained from:

A.V. Library, Visual Communications Services, OMAFRA, 52 Royal Road, Guelph, Ontario N1H 1G3, (519) 767-3622, fax (519) 824-9521.

Before you start the tape, ask members to note the sap preheater and the reverse osmosis machine in the video and find out what this equipment is used for. After the video answer any questions members might have and discuss what they just saw.

## Using A Refractometer

(20 minutes) page 19

The purpose of this activity is to learn how to use a refractometer. Some clubs may have already used a refractometer in meeting two ("Sap Sweetness" activity). For those clubs, this activity is optional.

Demonstrate how to use a refractometer. Use the information in the Members' Manual to help you (page 19). The OMAFRA Factsheet Maple Syrup: Measuring Density (Agdex 310/70) should also be consulted.

1. Split members into three groups. Split them up according to their hair colour, clothing colour or some other aspect of their appearance (not body size!).
2. One group at a time will use the refractometer to measure all three samples. Challenge the participants to find the sample with the highest Brix value.
3. You probably won't be able to get more than one refractometer. Thus, only one group can work on the refractometer readings at a time. Start the other groups on the next activity – designing their own games!

## Designing A Game

(30-55 minutes)

This activity can be started after the introduction of the refractometer. Members will be challenged to make a game based on syrup production. The game should emphasize the boiling stage. Encourage members to get information from their manuals (if they wish to). Possible games might be board games, mazes, quiz games, etc. Give the groups 30 to 45 minutes to come up with their game. Then, have them present their games to the rest of the club. If there is time, play the games during this meeting. Otherwise, members can play the games in meeting six. If the games are going to be played in meeting six, you will have to omit the rap song activity or the crossword.

## Wrapping It Up

(5 minutes)

1. Have members briefly summarize what they learned at this meeting.
2. Review the "Before the Next Meeting" activity (page 22).
3. If you are going to a Maple Syrup Festival next meeting, remind the 4-H members where and when to meet.
4. If you are going to do the "You Be the Judge" activity next meeting, ask for volunteers to bring in pure maple syrup containers. Five containers are suggested (500 mL or less, 1 L, 4 L and a couple of fancy containers). Remind the volunteers to find out how much their containers of syrup cost.

# Meeting 5

# Maple Marketing II

## Objectives

1. To review the difference between pure maple syrup and maple syrup substitutes by way of debate.
2. To learn how market research can help producers meet the needs and wants of consumers.
3. To learn how producers market maple products.
4. To apply targeting to a new method of marketing.
5. To examine syrup containers and costs.

## Special Notes For This Meeting

### Special Guest

Ask a member of the Ontario Maple Syrup Producers Association (OMSPA) to speak to your club about what they do. You could also ask a producer to talk about one or more of the new methods of marketing (page 25). You may need to adjust the activities to accommodate the guest speaker(s).

### Field Trip Alternative

If your club is doing this project in the spring, you might be able to go to a maple syrup festival for this meeting. In that case, you would forgo the activity ideas suggested. Instead, you would tour the festival and focus on the way maple syrup is promoted and sold. Before going, discuss market research. Have each member prepare one research question to ask people at the festival or a producer selling his or her syrup.

## In A Nutshell

Roll Call	5 min.
Debate: Which Is Better?	15 min.
Market Research	5 min.
Targeting and New Methods of Marketing	60 min.
Top Nine Ways to Promote Maple Products	10 min.
You Be the Judge!	20 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<hr/> 120 min.

## Preparation And Equipment

Depending on the selection of activities, you and/or a Youth Leader should prepare the following.

Debate: Which is Better?

- You will need scrap paper, markers and a watch or timer.

## Targeting and New Methods of Marketing

## Top Nine Ways to Promote Maple Products

## You Be the Judge!

## Project Completion Summary Sheets

## Roll Call

(5 minutes) page 23

## Debate: Which Is Better?

(15 minutes)

- You will need chart paper, markers and a video camera (optional).
- Before the meeting, write the list on page 47 of this guide on chart paper. Loosely tape a separate piece of dark paper over each line in the list.
- You will need:
  - one copy of page 49 of this guide for each member;
  - five pure maple syrup containers to compare (Suggested: 500 mL or less, 1 L, 4L, and a couple fancy containers.);
  - cost of each container of syrup and calculator;
  - one small dish for each container (for pouring test);
  - funnel and spatula to return syrup back to container.
- Read the note on page 52, this guide. If you want members and parents/guardians to complete the Project Summary sheet, give out copies at this meeting.

Ask each member to answer the roll call.

Members will use the information they collected in their home activity survey as a foundation for their debate.

1. Split the club in half. One side will be for pure maple syrup and the other will be for maple syrup substitutes.
2. Explain the debate process. Each group will be given two uninterrupted minutes to present their syrup as best. Then, each group will be given one minute to respond to what the other group said. After the rebuttals, the debate is over. Members should pay close attention because they will vote for the side that presented the best argument.
3. Give members 5 minutes to create their arguments and some paper and markers to write down their ideas.
4. Before calling the groups back together, have them elect one or two people to be the main debaters. Then, hold the debate and rebuttals.
5. When the debate is over, have members vote on which side presented the best points to support its argument. Invite members to raise their hands to cast their votes. Congratulate everyone for a job well-done!

## Market Research

(5 minutes) page 23

## Targeting And New Methods Of Marketing

(60 minutes) pages 23-27

After the roll call and debate, you can explain that the home activity was a kind of informal market research. Explain the purpose of market research. Use the information in the Manual to discuss other methods of market research.

### 1. **Targeting:** (10 minutes) page 23

Use the following scenario to teach members about targeting.

You are employees of an advertising agency. You have been chosen to design a campaign to sell a very expensive sports car called the Atlantis. To ensure a successful advertising campaign, the first thing your agency wants to do is identify the best target for its advertisements.

Use questioning to go through the Who, What, When, Where and Why of targeting (page 24). Write down the important points on chart paper. Some sample questions are:

Who would buy a sports car? Who is our target group?  
What should the campaign say about the car?  
When should we run the campaign?  
Where should we promote the car?  
Why are we advertising?

### 2. **New Methods of Marketing:** (10 minutes) page 25

Discuss companion marketing, Christmas marketing, unique packaging and marketing in other countries. Briefly explain what these new methods are about.

### 3. **Application of Targeting to New Methods of Marketing:** (15 minutes)

Invite members to target the new methods of marketing (just discussed). Break them into four groups, one for each new method of marketing. Have members outline the Who, What, When, Where and Why of their campaign on chart paper. They can refer to page 24. For instance a group doing companion marketing might produce something like this;

Who: We're trying to reach people who eat vegetables and fruits.

What: We want to tell them that maple syrup tastes good with different fruits and vegetables. We could give customers recipes to try.

When: We should try to promote this in the summer and fall



when fruits and vegetables are being harvested.

**Where:** We should target food magazines. People who read these magazines may be more willing to try new recipes with maple syrup. We should set up displays in grocery stores and at farmers' markets.

**Why:** Because we want to sell more maple syrup in the summer and fall, not just the spring.

For "Marketing Around the World," invite the group to pick one country in which to market their syrup and work from there. For "Packaging" have the group promote an easy to pour bottle that is shaped like a maple leaf or let them make up their own container to promote.

#### 4. T.V. or Radio Commercials: (25 minutes)

Challenge each group to create a T.V. commercial (skit) or radio commercial which relates to its new method of marketing. Give members 15 minutes to create their commercial. Then, let them show their stuff! If you have access to a video camera, video tape their productions. You might be able to show the video as part of the club's Achievement Program.

## Top Nine Ways To Promote Maple Syrup

(10 minutes) page 26

Instead of just discussing other ways that producers promote their products, why don't you make a game out of it? Write the following list down on a large sheet of paper. Then, cover up each line with a smaller piece of dark paper. Tape the entire list on the wall. Play this game like T.V.'s Family Feud. Tell members that the top nine answers are on the board. Read the question: "Name one way that maple products are promoted." You peel off the pieces of paper and reveal the answers as they suggest them. When members run out of ideas, reveal any answers that are still covered. Afterwards, add additional ideas to the bottom of the list.

- festivals
- tours
- competitions (Royal Winter Fair)
- displays
- taste testing
- word of mouth
- advertising
- consumer education
- Ontario Maple Syrup Producer's Association (OMSPA)

## You Be The Judge!

(20 minutes)

The purpose of this activity is for members to judge several features of syrup containers. The participants will also examine the retail price of various containers to determine which containers cost more per mL of syrup.

1. Number the containers one to five. Display them along with their price. Give a copy of the Container Comparison Chart on page 49 of this guide to each member.
2. Demonstrate how to judge the containers. For the carrying test, explain that members can just pick up the syrup. They should ask themselves, "How easy would it be to carry this container around?" For the pouring test, show members that they can pour syrup (or water if the container is empty) into a dish and then return it to the container using a funnel. They should look for liquid dripping down the sides of the container. Participants should also ask themselves if the container is too big or awkward to pour. For storing and appearance, explain that they can rate the containers by looking at them. They should decide if the container would fit easily into their fridge. They should also decide if the container is attractive or appealing.

Explain that the first four features are rated out of five where five is excellent and zero is terrible. Members will have to figure out the cost of the syrup per mL so they can compare the containers on a cost basis. You may have to help the participants with this mathematical aspect of the activity.

3. For a change of pace, let members do this activity individually. Give them 15 minutes to judge the containers.
4. Discuss which containers they liked best and why.

## Wrapping It Up

(5 minutes)

1. Have 4-H members briefly summarize what they learned at this meeting.
2. Review the "Before the Next Meeting" activity (page 26).
3. If members are choosing recipes to make at the next meeting, do so at this time. Also, assign responsibility for getting ingredients or equipment.

## Container Comparison Chart

Syrup Container	Pouring (excellent = 5)	Carrying (excellent = 5)	Storage (excellent = 5)	Appearance (excellent = 5)	Cost (per mL)
1					
2					
3					
4					
5					

Which container would you buy? Which container do you think a maple syrup producer would like you to buy?

# Meeting 6

# From Tree To Table

## Objectives

1. To learn how to substitute maple syrup for sugar, corn syrup or honey.
2. To learn about new food products maple producers are developing.
3. To make recipes that use maple syrup.
4. To evaluate the project.
5. To prepare for the Achievement Program.

## Special Notes For This Meeting

### Baking Group Size

This meeting focuses on the preparation of maple recipes. The ideal cooking group size is 2 or 3. If you have a large club, it's best to increase the number of groups rather than group size. You might let these additional groups try making pure maple products or recipes that are favourites in your local area.

### Preparation of Maple Baked Beans

There is not enough time to prepare Maple Baked Beans during a meeting. Ask a youth leader or another member to make the beans at home and bring them to this meeting.

### Playing Games Designed by Members During Meeting #4

Adjust the activities if members wish to showcase their games.

## In A Nutshell

Roll Call	5 min.
How to Substitute Maple Syrup	10 min.
Let's Bake	60 min.
Sugar Bush Crossword	10 min.
Rap Song	15 min.
Taking Care of Business	10 min.
Wrapping It Up	5 min.
<b>TOTAL</b>	<b>115 min.</b>

## Preparation And Equipment

Depending on the selection of activities, you and/or a Youth Leader should prepare the following.

### How to Substitute Maple Syrup

- You will need recipe books and calculators (1 for every 3 members).

Let's Bake

- Before the meeting, review recipes. Check to make sure you have all equipment and ingredients.

Sugar Bush Crossword

- Copy one crossword for each member (page 54, this guide).

Rap Song

- You will need chart paper and markers.

## Roll Call

(5 minutes) page 27

Ask each member to answer the roll call.

## How To Substitute Maple Syrup

(10 minutes) Recipe Booklet  
page R18

Break members into groups of three. Give each group a recipe book. Tell them to find a recipe in which they can substitute maple syrup for sugar. Then, demonstrate how to change the liquid ingredients to account for the water in maple syrup. They can use calculators to find the amount of liquid required in their own recipe. Invite groups to share the altered recipe.

Then, discuss how you can substitute maple syrup for corn syrup and honey. Maple producers are also altering recipes and making new food products to sell to their customers (eg. maple peanut brittle) (see page 27).

## Let's Bake

(60 minutes)

Break members into baking groups. The following recipes are suggested for members taking this project.

- Maple Popcorn
- Maple Baked Beans (made before the meeting)
- Oat Pancakes
- Blender French Dressing with Maple Syrup (This is best tasted with a vegetable salad)
- Maple Apple Crisp

If you have a small club you might want to choose only two or three of these recipes. Large groups could make one of the pure maple products (soft maple sugar and hard maple sugar are recommended for more experienced cooks). Have members record their reactions to different recipes in their Recipe Log (page 28).

## Sugar Bush Crossword

(10 minutes or during "Let's  
Bake" time)

The purpose of the crossword (page 54, this guide) is to review what members have learned during the project. Members can do the crossword together or the cooking groups can do the crossword when they have time between preparation, cooking and eating.

Answers

Across

Down

- |                   |                   |
|-------------------|-------------------|
| 1. cattle         | 1. crown          |
| 9. festival       | 7. sap            |
| 17. OMSPA         | 11. spile         |
| 36. maple         | 19. sap preheater |
| 41. enemy         | 30. evaporator    |
| 49. cold          | 35. syrup         |
| 61. filter        | 53. thinning      |
| 74. refractometer | 67. vacuum        |
| 92. main          |                   |

## Rap Song

(15 minutes)

Instead of the crossword, or after the crossword, have members make up a rap or a song to summarize this club. The song could include personal stories or accounts of what happened during the club (not just maple syrup information). Split the club into two groups. Give the groups chart paper and some markers. Allow 10 minutes for members to write the lyrics of their rap. When the time is up, give each group a chance to sing its song or say its rap.

## Taking Care Of Business

(10 minutes)

### Project Completion

A Certificate of Completion and a Project Summary have been included in this guide, pages 55-56. Your signature on either of these indicates you feel the member has completed the project to the best of his or her ability. Space is provided for you to add some individual comments to offer encouragement to the member. The Project Summary sheet also asks for written feedback from the member and his or her parents or guardians. (The questions on this sheet have been selected from the informal evaluation sentences, listed below.) Select whichever sheet best meets your needs and make copies for the members.

It is recommended that the certificates not be awarded until the Achievement Program. If you give them out before this time, some members mistakenly assume that they don't need to participate in the program.

### It Worked For Us!

Your experience in leading this club would be helpful to another leader in your area. You are encouraged to make some comments about the project, what resources you

discovered locally and members' feelings about the project and pass this information on to your 4-H Association. The Resource Development Committee of the Ontario 4-H Council is interested in your comments too. Their address is in this guide, page 11.

### **Informal Evaluation**

Take a few minutes at the last meeting to do an informal evaluation with members. One way to do this is to ask them to complete one or all of the following sentences. Remind the 4-H members to give honest answers.

- I joined this club because ...
- I really enjoyed ...
- I didn't enjoy ...
- I had a hard time ...
- The best meeting was ...
- The worst meeting was ...
- My favourite meeting activity was ...
- My least favourite meeting activity was ...
- If I were to take this project again, I would change ...
- My favourite recipe was ...
- My least favourite recipe was ...
- I've learned ...
- I've changed ...
- I'm glad ...
- Overall, I would rate this project \_ out of 10.

### **Achievement Program Planning**

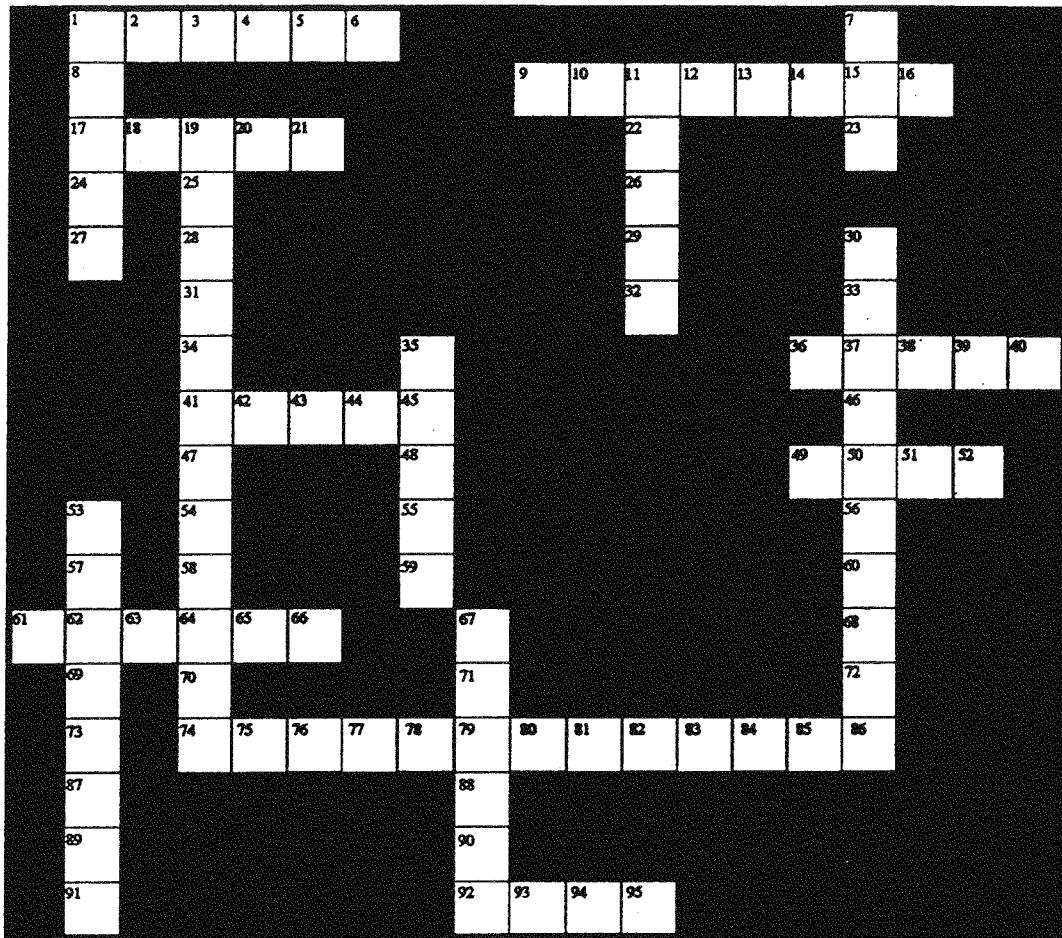
List all of the tasks that must be done for the Achievement Program. Set deadlines and dates for each task.

## **Wrapping It Up**

1. Have members briefly summarize what they learned at this meeting or during this project.
2. Remind 4-H members of the location, time and their responsibilities for the Achievement Program.
3. Remind 4-H members to complete their special activity.

**THANK YOU FOR BEING  
A VOLUNTEER 4-H LEADER!**

# Sugarbush Crossword



## Clues Across

1. You shouldn't let these animals graze in your sugar bush.
9. When a town or city has a special day to celebrate maple syrup and spring, it is called a maple syrup \_\_\_\_\_.
17. The short form for the Ontario Maple Syrup Producers Association.
36. The kind of leaf which is on the Canadian flag.
41. The Forest Tent Caterpillar is a \_\_\_\_\_ of the sugar bush.
49. Sap will flow when there is a \_\_\_\_\_ night followed by a warm day.
61. You need to do this to finished syrup to get rid of sugar sand.
74. You can use this tool to measure the density of one drop of sap or syrup.
92. The sap moves through the dropline, lateral line and the \_\_\_\_\_ line to the storage tank.

## Clues Down

1. A good crop tree has a long wide \_\_\_\_\_ . (What a king wears on his head.)
7. You boil this clear liquid from a tree to make syrup.
11. The name for the spout-like device that helps the sap drain away from the tree.
19. This piece of equipment uses steam to preheat the sap before it gets to the evaporator.
30. The piece of equipment that is used to boil the sap.
35. What most people love to pour on their pancakes.
53. What you call it when you cut down certain trees to make growing space for other ones.
67. Sap can be pulled through plastic tubing by gravity or a \_\_\_\_\_ pump.





## MAPLE SYRUP - ADVANCED

Congratulations on successfully completing  
this 4-H project.

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\_\_\_\_\_  
Date

\_\_\_\_\_  
Club Leader's Signature

# PROJECT SUMMARY - MAPLE SYRUP

(complete at the end of the project)

## A. Member Comments:

1. I joined this club because ... \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

2. I really enjoyed ... \_\_\_\_\_

\_\_\_\_\_

I didn't enjoy ... \_\_\_\_\_

\_\_\_\_\_

3. If I were to take this project again, I would change ... \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4. I've learned ... \_\_\_\_\_

\_\_\_\_\_

5. I'm glad ... \_\_\_\_\_

\_\_\_\_\_

## B. Parent/Guardian Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## C. Leader Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

This project has been completed satisfactorily.

Member \_\_\_\_\_

Leader \_\_\_\_\_

Date \_\_\_\_\_

Leader \_\_\_\_\_

# Maple Syrup

## Advanced



Name \_\_\_\_\_ Age \_\_\_\_\_

Club \_\_\_\_\_



Ontario  
4-H Council



Ministry of Agriculture,  
Food and Rural Affairs

## THE 4-H PLEDGE

"I pledge:  
My Head to clearer thinking  
My Heart to greater loyalty  
My Hands to larger service  
My Health to better living  
For my club, my community and my country."

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*The primary purpose of the 4-H program is the personal development of youth in rural Ontario.*

## **Introduction**

### *The Maple Syrup Project*

Maple trees and maple syrup are unique parts of Canada's history and culture. Seventy percent of the world's maple syrup is made in Canada. Making maple syrup can be a challenge. If you want to make syrup, you need to understand all the steps: maintaining the sugar bush, tapping trees and collecting sap, and boiling the sap. You also need to learn how to market your finished maple products. This club should help you develop skills, knowledge and confidence in these areas. You will also be able to make and taste great foods made with maple products. Mmmmmm!

### *Objectives*

You will be able:

- To describe the major steps in making maple syrup and the equipment used in the process
- To describe a healthy sugar bush
- To talk about ways that maple products can be marketed
- To make recipes which include maple products
- To have fun and make new friends.

### *General Requirements*

A member will complete a project satisfactorily by:

1. participating in at least 2/3 of his/her own club meeting time;
2. completing the project requirements to the satisfaction of the club leader(s);
3. taking part in an Achievement Program.

## Meeting Schedule

	DATE	TIME	PLACE
MEETING ONE			
MEETING TWO			
MEETING THREE			
MEETING FOUR			
MEETING FIVE			
MEETING SIX			
ACHIEVEMENT PROGRAM			

The 4-H Resource Development Subcommittee of the Ontario 4-H Council reviews and evaluates 4-H resources. Comments and suggestions about 4-H manuals and guides are always welcome. They may be sent to the following address.

4-H Resource Development Subcommittee  
Ontario 4-H Council  
RR#1  
Thornloe, Ontario  
P0J 1S0



# Get Involved

Be willing to let your name stand for an executive position. It is a rewarding and fun experience. Following your club's elections, complete this club executive chart.

## CLUB EXECUTIVE:

	Name	Phone
PRESIDENT	_____	_____
VICE-PRESIDENT	_____	_____
SECRETARY	_____	_____
TREASURER	_____	_____
PRESS REPORTER	_____	_____
OTHER	_____	_____

## CLUB MEMBERSHIP:

Members, Phone	Members, Phone
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Leaders, Phone	Leaders, Phone
_____	_____
_____	_____

OMAFRA Contact, Phone	4-H Association Contact, Phone
_____	_____

# Healthy Trees Make Happy Forests!

## *Roll Call*

Why do you want to take this project?

## *Choosing a Sugar Bush*

Do you like being your own boss? Do you like the outdoors? Are you willing to work long hours for many days in a row? If you answered yes to these questions, you might like to run your own sugar bush someday. Answering the questions below will help you choose a future sugar bush or decide how to expand an existing bush.

- How easy is it to reach the woodlot? Can you get there without much effort at all times of the year?
- How far is the woodlot from the sugar shack? How far will you have to transport the sap?
- How steep is the land on which the woodlot is located? Level ground is better for gathering with buckets. Tubing systems work better on sloping land.
- In which direction does the woodlot slope? Woodlots facing east or south get more sunlight in the late winter. Trees warm up earlier and produce the season's first sap.
- In what kind of soil is the woodlot growing? Maple trees grow best in moist, well-drained, deep soils. Stony land is not a problem as long as the soil is deep enough for the roots to grow.

- How mature and healthy are the trees? A sugar bush should have a good variety of tree ages – from seedlings to mature trees. The bush can then produce sap right away and will have young trees to replace old or damaged ones.

## *Enemies of the Sugar Bush*

Once you choose a sugar bush, you want to keep it healthy. The health of a young or old sugar bush can be stressed by a number of enemies. The enemy may be a result of nature or people. This section will help you learn about maple enemies. Look closely at trees in your yard, neighbourhood or woodlot so you can detect problems before they become too serious.

### CLIMATE OR WEATHER

Wind, snow, frost and droughts can all hurt trees. Heavy snow and wind can tear branches off maple trees. A long time without rain can starve a tree of moisture. Trees, like people, need water to survive! Without an insulating layer of snow, a deep frost can kill the roots of a tree. As well, a late spring frost can freeze a young tree's leaves and shoots. All woodlot owners can do is hope that Mother Nature is kind to their woodlots.





## INSECTS

Insects or their larvae also attack the maple tree. Insects eat leaves or bore tunnels in the tree's wood. A large attack by leaf eating larvae can decrease the amount and sweetness of sap. This is because sugar is made in the tree's leaves. Damaged leaves mean the tree won't have as much sugar. You should contact a pest expert to find out the best way to control insects. Here are five common insects that attack the maple tree.

### Forest Tent Caterpillar

Look for silky mats on trunks and branches. This hairy, 5 cm long insect is a grey-blue colour and has a row of white or yellow spots on its back. Thin, orange lines and wide, blue stripes run along its sides. You will find these caterpillars until they spin their cocoons in June. You may spot their glossy egg cylinders on small twigs. They sometimes eat every leaf on a tree!



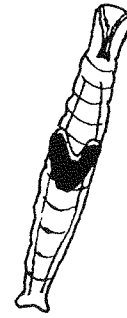
### Sugar Maple Borer

This black and yellow beetle has long antennae and lays its eggs in a tree's bark. The larvae hatch and feed on the outer sapwood layer of the tree, resulting in small tunnels. Then, the bark cracks and falls off, exposing the sapwood. This doesn't kill the tree, but makes it open to attack from other enemies. Some branches may die because sap cannot flow through damaged areas.



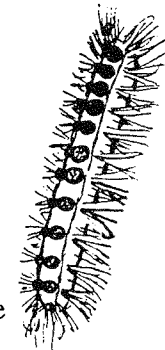
### Saddled Prominent

This hairless caterpillar can be found in the mid to late summer. It is a yellow-green colour with some small stripes on its head. On its back it has a red mark shaped like a saddle. This insect eats the whole leaf except for the veins.



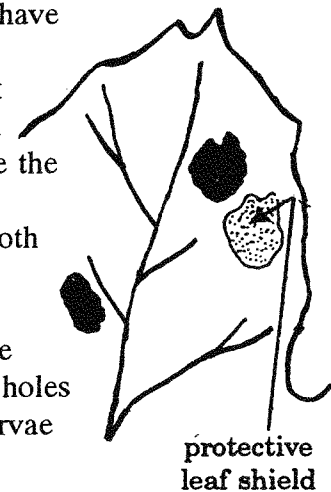
### Gypsy Moth

Look for a 3 to 7 cm long, hairy caterpillar. It has pairs of blue spots on one end of its back and red spots on the other. The moth leaves beige coloured egg masses on branches. The gypsy moth caterpillar may eat the leaves of the maple tree.

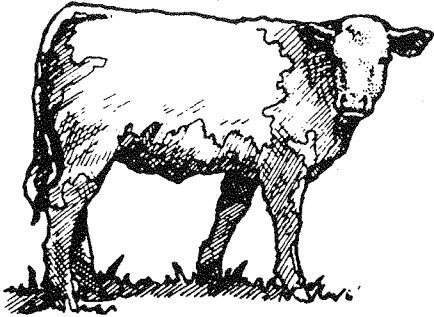


### Maple Leaf Cutter

Look for leaves that have brown spots in the summer. If you look closely, you will find small holes that make the leaf look like swiss cheese! The adult moth lays its eggs on the underside of the leaf. Then, the small larvae mine tunnels and eat holes in the leaves. The larvae use the leaf pieces as shields for protection, carrying these pieces wherever they go. Some farmers have noticed hundreds of pieces of brown leaves walking down a tree trunk!



Soil is pressed down by grazing livestock. When grains of soil get jammed together, this cuts down on the air spaces between them. Air spaces hold water and carbon dioxide that a tree needs to live. To avoid this kind of damage, just keep the livestock out of your woodlot.

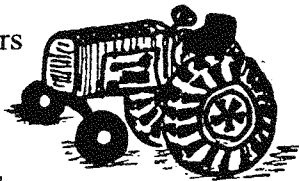


### PEOPLE

People can hurt trees too! You can prevent or reduce "people" stressors by acting wisely.

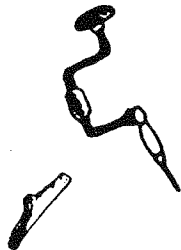
#### Machinery

Try not to use heavy machinery like tractors when the soil is wet and muddy. The equipment sinks and slides in the mud and can hurt the roots and trunks of maple trees.



#### Tapping

When you tap a tree, it causes a wound in the bark where infection can enter. Be sure to use clean tools when tapping. Also, make sure that you follow tapping instructions with care. If you do this, tapping should not be a problem.

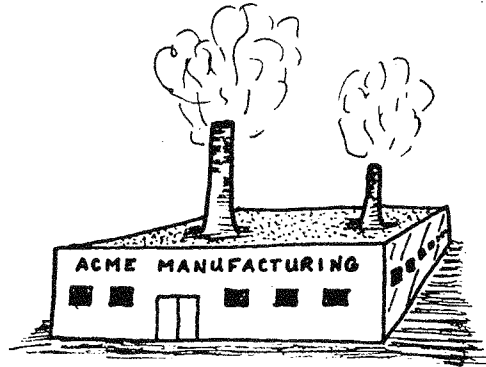


#### Sunscald

Have you ever gotten a sunburn? Trees can be hurt by the sun too! Sunscald happens when a tree's bark is exposed to the warm sun and drying winds all at once. This exposure causes splits in the thin bark of young trees. Cutting down too many trees at once can leave large spaces in the forest covering. Sudden large spaces shock trees by allowing in too much sunlight and wind.

#### Pollution

Pollution may make trees weak and slow their growth. Acid rain is a form of air pollution that may affect woodlots. People cause pollution by driving cars and by producing and using many products. Can you think of ways that pollution can be reduced?



### DOUBLE WHAMMY!

By themselves, these enemies seldom kill a tree. But a combination of enemies over many years can cause trees to weaken and die. Trees can only take so much! To protect trees, be woodlot wise and pay close attention to warning signs.

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### BEFORE THE NEXT MEETING

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Take a walk around your yard or neighbourhood. Try to find a tree that looks like it has been stressed by an enemy. Draw the tree and guess what caused the stress.

# Woodlot Wise

## *Roll Call*

How do you know if a tree is healthy?

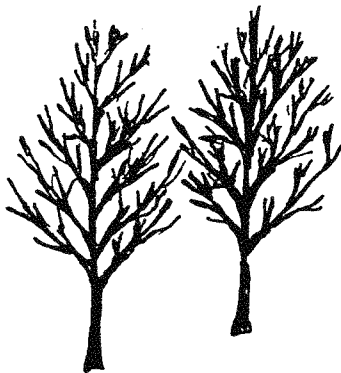
## *Thinning and Improving The Woodlot*

**What?** Thinning is the process of cutting down certain trees to make growing space for other trees. The trees that are left are the crop trees that will become part of a producer's maple syrup production.

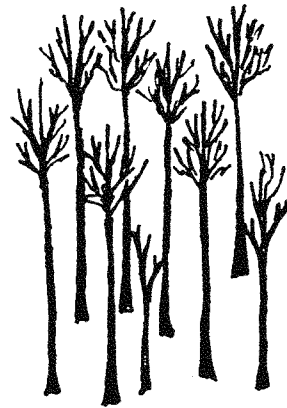
**Why?** Thinning helps large, healthy, sugar-rich trees to grow. If trees are crowded, they won't develop large crowns with many leaves. The more leaves a tree has to make sugar, the

sweeter the tree's sap will be. Thinning gives maple trees the room they need to grow.

**When?** Most producers thin their woodlots when the trees are between 8 and 13 cm in diameter. At this time, the best trees are easier to pick out. Trees may not grow as large or produce as much sap if a farmer leaves thinning until later.



THINNED WOODLOT



UNTHINNED WOODLOT

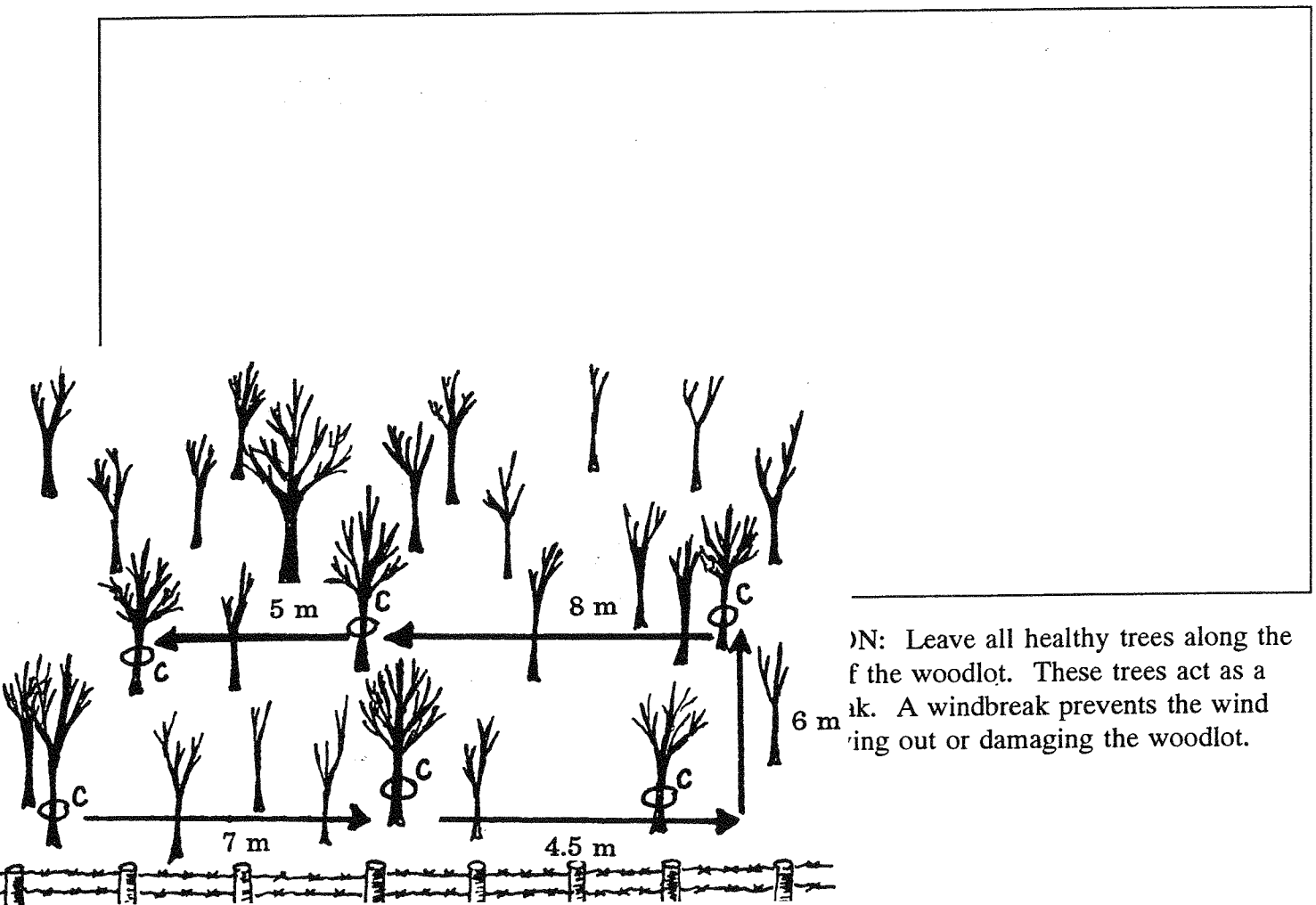
### Features of Good Crop Trees

A good crop tree:

- is a sugar or black maple
- has a straight trunk (not forked)
- has a wide, long crown (egg shaped – not flat-topped or rounded)
- is free of defects (eg. splits, wounds, rot, fungus, etc.)
- is a young, fast growing tree (young trees have smooth bark)
- has sweet sap (normal range 1.5-4.0% sugar).

## HOW DO YOU SELECT CROP TREES?

1. The best time to mark crop trees is in the summer. The summer is best because you can look at a tree's leaves to tell how healthy it is.
2. Start at the inside edge of the windbreak. Pick a crop tree using the "Features of a Good Crop Tree" section to guide you (found above). Tie ribbon around the crop tree or mark it with a spot of blue paint (see page 11 for tree marking details).
3. Pace about 6 meters (8 steps) forward in a straight line. Choose another crop tree. The crop tree likely won't be exactly 6 meters away. You can pick a good crop tree anywhere between 4 and 8 meters away.
4. Keep doing this until you reach the end of the bush. Then, turn to your left or right. Pace another 6 meters. Pick a crop tree and mark it. Now, you should head back the way you came in a line parallel to the first line of crop trees.
5. Keep on pacing and marking in this manner until you reach the end of the woodlot.
6. When spring comes, measure the sugar content of the sap in the crop trees. Compare the crop trees' sugar content to other possible crop trees in the area. If other possible crop trees are more than 1% sweeter, pick a new crop tree. (See instructions on page 11 to learn how to measure sap sweetness.)
7. Now, you are ready to begin thinning and improving the sugar bush.



NOTE: Leave all healthy trees along the edge of the woodlot. These trees act as a windbreak. A windbreak prevents the wind from blowing out or damaging the woodlot.

## WHICH TREES SHOULD BE CUT?

The best time to cut down trees is in the fall or the winter. At this time, it is cool and the ground is firm. Spring is the worst time to cut down trees. Tender bark can be damaged by falling trees and tractors hauling out logs.

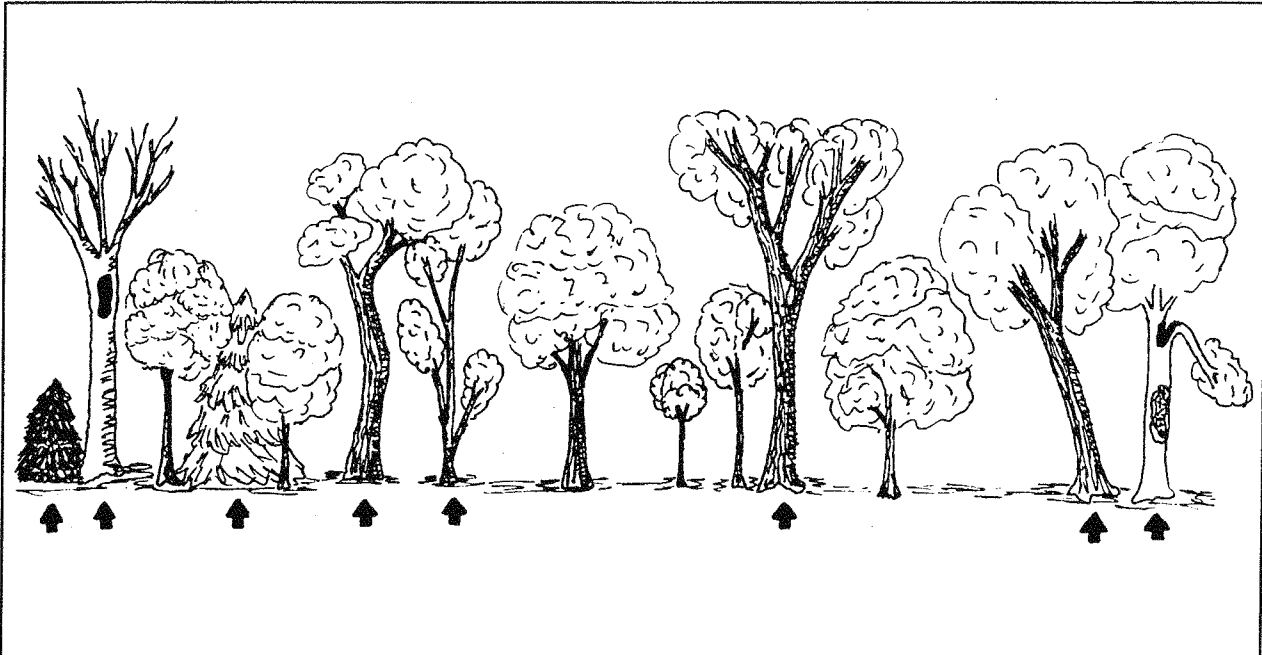
First, remove:

- Tree Crowders – Cut down any tree whose branches touch the crown of the crop tree. These trees are competitors. The crown of a crop tree needs 1 to 1.5 m of open space on at least two sides.

Then, remove:

- large, old trees (to allow young trees to grow)
- trees that have defects or diseases (dead tops, fungi, crooked, leaning, etc.)
- trees producing sap with less than 1% sugar
- other tree species whose sap will not be used for syrup.

Look at the picture below. Why do the trees marked with arrows need to be removed?



**CAUTION:** You don't want to leave large spaces in the forest covering. Spaces bigger than 3 m are too big. Sudden, large spaces shock trees by allowing in too much sunlight and wind. If several trees in one spot need to be removed, you should only cut down one or two at a time.

Your job isn't done yet! Keep a close eye on the woodlot. More thinning may be needed in a few years. You might have to cut down damaged or diseased trees in the mean time.

## *Tree Marking*

You might want to mark crop trees or the boundaries of the sugar bush. To do this, you can use tree-marking paint. The first thing you have to do is choose a paint type. There are two types of paint used for marking trees.

**Paint in aerosol cans** This kind of paint should be applied when the temperature is above freezing. One 454 g can will mark as many as 200 to 300 trees. This paint lasts for about 10 years.

**Paint in tubes** Tube markers are good for marking trees with letters or numbers. It should also be used when the temperature is well above freezing. A tube can mark as many as 100 trees (using 5 cm letters). This paint will remain on the tree for 10 to 15 years.

Next, choose the colour of the paint. Certain colours are most often used for specific jobs.

- 1. If you want to mark trees to be cut down...**  
Put a spot of yellow paint about 1.4 m high. In order to see the trees easily, mark all trees to be removed on the same side.
- 2. If you want to mark the boundaries of the sugar bush...**  
Put a spot of red paint on trees which grow at the edge of the bush.
- 3. If you want to mark future crop trees...**  
Put a spot of blue on trees which have good crop tree features (see page 8 for these features).

- 4. If you want to mark the proper number of taps...**

Put white paint spots on the tree. The number of spots can be a symbol for the number of taps. A paint tube could be used to print the number on the tree. (A tree should be measured every 5 to 10 years to make sure that the number of taps is right for the diameter of the tree.)

- 5. If you want to mark the tubing layout...**  
Try using one paint colour for each lateral line. Start marking from the main line and mark the trees with arrows.

Finally, you should conserve paint by making markings a reasonable size.

## *Measuring Sap Sweetness*

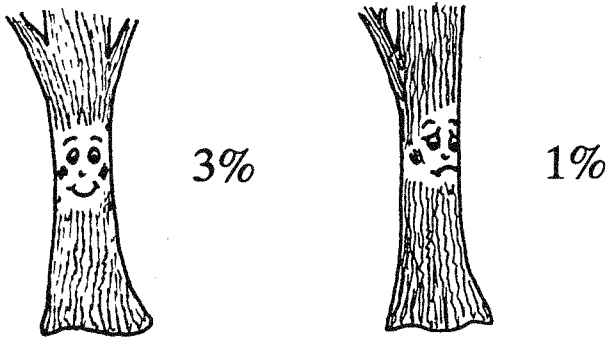
Sap sweetness refers to the amount of sugar in sap. An average tree has sap with between 1 and 4% sugar. To measure sap sweetness, you can use a sugar refractometer. It is best to measure sap sweetness in the spring. Do not test sap on a rainy or windy day. Pick a day when there will likely be good sap flow (a cold night, followed by a warm day). To compare tree sweetness, you should take measurements within 2 hours of each other. The sugar content of sap can change from hour to hour and from day to day.

1. Check the air temperature. (If the temperature is not 20°C, you will have to adjust the refractometer reading using a temperature correction table.)
2. Punch a small nail about 6 cm deep into a tree trunk.
3. Stick a toothpick or hypodermic needle into the small hole. Soon, sap will drip from the end of the needle or toothpick.

4. Let 10 to 20 drops fall. Then, catch a drop on the refractometer.
5. Take a reading from the refractometer and use a temperature correction table. (See page 19 for more information.)
6. You should use a new toothpick for each tree or wash the hypodermic needle after each reading. The refractometer should be cleaned between readings too. Use rubbing alcohol to clean it and allow the alcohol to evaporate away.

## *Does Sap Sweetness Make a Difference?*

A maple syrup producer wants trees that produce the sweetest and the greatest amount of sap. Sweeter sap means more syrup is produced, which means more money for the farmer. You might think that there isn't much difference between a sugar bush with 2% sap sweetness and a sugar bush with 3% sap sweetness. The bush with 3% sap would yield



50% more syrup than the bush with 2% sap! That's a big difference! This is why it is so important to choose the healthiest and sweetest crop trees. Also, woodlots that are properly thinned are the ones that often have the sweetest sap. These trees can grow large, leafy tops which make lots of sugar.

## *Taphole Yield Factor*

The taphole yield factor is the number of taps that a certain farm needs to produce enough sap for one litre of syrup. You can figure it out by dividing the total number of tapholes by the number of litres of maple syrup made during the season.

$$\text{taphole yield factor} = \frac{\text{\# of tapholes}}{\text{\# of litres of maple syrup produced in a season}}$$

The lower the factor, the better. A low factor means the producer is producing a lot of syrup with only a few tapholes. To produce a litre of syrup a very good bush would need less than one taphole and a poor bush would need more than two. A producer can lower his or her taphole yield factor by managing a sugar bush wisely (eg. choosing good crop trees, thinning, etc.). By lowering the taphole yield factor, a producer should be able to increase profits.

## *Management Help*

Contact the local Ministry of Natural Resources (MNR) office. They can provide woodlot management advice and point you towards other resources that are available to sugar bush owners.

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## **BEFORE THE NEXT MEETING**

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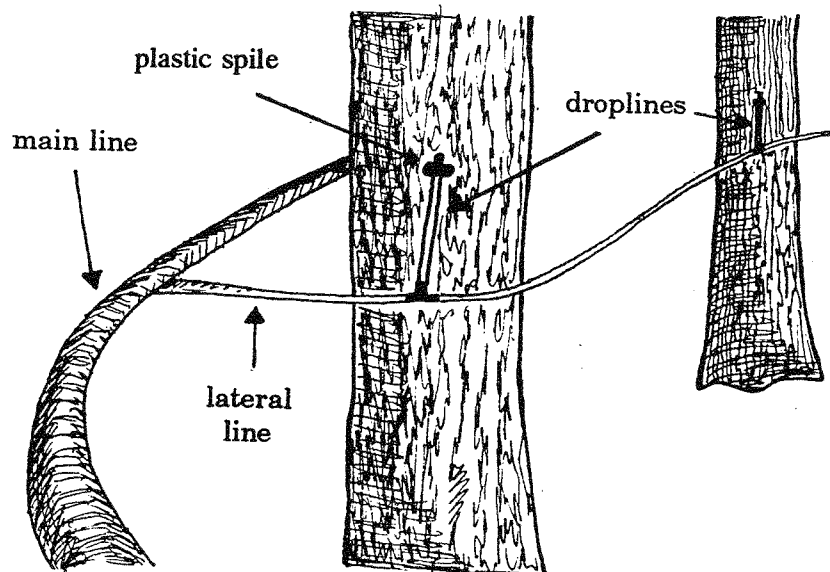
Examine some maps in an atlas at school or even a road map in your car. Look at the way symbols are used to stand for certain things. How are different colours used? Examine the details of the maps. You will use this research to help you make your own map at the next meeting.

# Producers Kick the Bucket!

## *Roll Call*

Use two words to describe the bucket method of collecting sap.

## *Tubing Systems - Kicking the Bucket!*



As you know, plastic tubing is a modern way to collect sap. There are 4 main parts to a tubing system. They are:

1. plastic spile
2. dropline
3. lateral line
4. main line.

The short dropline goes from the spile to the lateral line. The lateral line then joins the larger main line. The main line carries the sap to the storage tank.



## TWO TYPES OF TUBING SYSTEMS

### Vented System

A vented system used to have vents at every tap and on the main line. Now, producers only place vents on the spiles furthest from the storage tank. Producers believe that vents help get the sap moving and prevent air locks which can stop the flow of sap.

### Closed System

The closed system has no vents and is leak-free. A closed system is always used with a vacuum pump which sucks the sap through the tubing.

## SETTING UP A TUBING SYSTEM

It takes a lot of time to set up a tubing system. But, tubing systems mean less hard work when it comes to gathering the sap. Also, tubing systems can be left in place for the following season.

1. Set out the large main line(s) first. Either place it underground below the frost line or hang it a bit above the snow line.

2. String out the lateral lines next. Tie the lateral tubing to the mainline. Then, pull the lateral tubing fairly tight as you move from tree to tree. A lateral line can have as many as 20 droplines joined to it. When it is time to tap, use a manifold to join the lateral line to the main line.
3. Finally, join the tree to the lateral line with a dropline. Before tapping begins, attach the spiles, droplines and t-connectors. Then, when the lateral line is cut at the tree, you can quickly join the dropline to it. Start with the first tree closest to the mainline and work your way outwards. Keep on pulling the lateral as tight as possible, cutting the lateral and joining the dropline until all of the trees are linked.

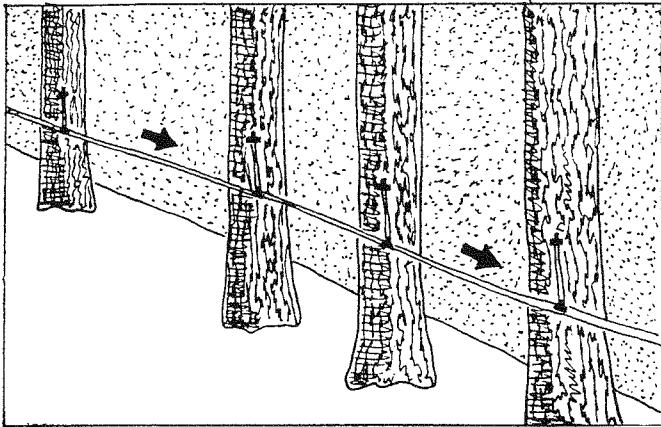
It is best to make drop and lateral lines out of 0.8 cm (5/16 inch) tubing. Main lines are made out of 1.25 to 5 cm (1/2 to 2 inch) tubing. The more lateral lines feeding into a main line, the bigger the main line pipe needs to be.

### Things To Avoid

1. Sags in the main line interfere with the pull of gravity.
2. Crimps at the spile or connectors block the flow of sap.
3. Leaks in a closed system interfere with the vacuum pull.
4. Lines under evergreen trees thaw slowly.
5. Tubing separated from connectors lose sap.
6. U-shaped droplines interfere with the pull of gravity.
7. Tapholes that do not slope to the main line interfere with the pull of gravity. (eg. If a taphole is placed lower than the hole before it, the pull of gravity doesn't work as well.)
8. If an attachment point on the manifold (the part used to join the main line to the lateral line) is not going to be used, it should be capped. Otherwise, sap is lost.

## Methods Of Moving Sap

### GRAVITY



SAP FLOWS DOWNHILL PULLED BY THE FORCE OF GRAVITY

Some producers use the force of gravity alone to draw sap through tubing. Gravity is the word that describes how objects tend to be pulled towards or attracted to the earth. For instance, when an apple falls off a tree, it falls down to the ground not up into the sky or sideways. Sap will naturally flow to a lower level or closer to the earth if the tubing is set up to let this happen. This is very important. For gravity to work, either the ground or the pipeline must slope downwards. Sap will not run upwards on its own. This means that you need to set up the tubing so that the sap can run downhill.

### VACUUM PUMPS

Did you know that you can now get more sap from each taphole by using a vacuum pump? Vacuum pumps remove air from tubing lines and create a suction. Think about your vacuum at home sucking up dirt or how you suck up liquid in a straw. Vacuum pumps can move sap 0.3 km or more. Best of all, this invention does not appear to hurt the trees. There are two types of vacuum systems.

**Wet System** In a wet system, the pump is on the main line. It pumps both air

and sap through the line. The vacuum from this kind of system is not as strong. Another problem with the wet system is that it recirculates the sap in times of low sap flow. This tends to warm the sap and results in the production of a lower quality syrup.

**Dry System** Most producers prefer this system. A vacuum pump is used to suck air from a tank. This, in turn, pulls the sap through the tubing into the tank. Then another pump (which is stronger than the first), or a dumping unit, is used to move the sap to a storage tank. Some small operations use old milker pumps for this system. The dry system is more effective than the wet system because better suction, or vacuum, is created.

In order to use the pumps most efficiently, most producers still try to set out tubing to take advantage of the natural slopes in the land. The pumps are turned on when it is warm enough for sap to flow and are turned off at night when temperatures get too cold.

Compared to buckets, producers can collect as much as 50% more sap with vacuum systems. The pumps can draw sap from trees even on days when there is poor weather. On these days, natural sap flow would be slow. Because vacuum systems are less weather-dependent, the amount of sap gathered from year to year is more stable or even. This results in a more stable income for the producer.

## *Cleaning The Tubing*

At the end of the season, the tubing can be left in the bush for the next season or taken down and stored for the following year. Whether the lines are left out or stored, every line should be cleaned. A diluted chlorine bleach solution will clean them. Just mix one part unscented household bleach in 40 parts of water.

### **1. If you leave the system in the woods...**

Remove the spiles from the trees, cap them and tie them to the trees with twine. Then pump a bleach solution through the tubing. Check each spile to make sure the solution reaches every tube.

The main line is most often left in the sugar bush. Cap all connections and then pump the solution from one end to the other. Allow the line to drain and then cap both ends.

### **2. If you take the system down and store it...**

Take down each lateral line (including the drop lines and spiles) and roll them in a coil. Hook several lateral lines up to a pump at one time. Then, the pump can move the bleach solution from a porcelain bath tub through the coiled tubes. To blow the solution out of the lines, use an air compressor. Put the lines in a cool, dark, rodent-free place until next season.

### **3. If you have a tubing washer...**

Coil each lateral line (including the drop lines and spiles) on a wooden reel. Then put four or five of the reels onto the washing rod. Lower the rod into a tank which contains the bleach solution. A motor will turn the rod and coils. This will cause some of the solution to be picked up in the coils each time the rod

turns. Raise the rod out of the water and turn on the motor. The solution will empty out of the tubes as the rod turns. Store each lateral line on its own reel in a cool, dark place.

## *Marking The Tubing System*

The old saying "a stitch in time saves nine" applies here. Marking your trees and tubing once you have it up can save you time putting the tubing up each spring. For instance, the first lateral line could be the "A" line. The first spile goes to the tree marked A1, the second to A2 and so on. Mark the trees with tree-marking paint. (See the "Woodlot Wise" meeting.) Mark the lateral lines by firmly attaching a metal, a plastic or a wooden tag with the letter of the line. Also, attach a marker to the main line where the lateral line will join it.

## *Storing The Sap*

Most producers try to have about 9 litres of storage for every tap they have. Sap storage tanks must be clean and should be approved for use with food. Most often they are made of plastic or stainless steel. They come in all shapes and sizes (eg. new plastic garbage cans, milk cans or large steel tanks). When empty, the tanks should be cleaned with a solution of one part bleach to 40 parts water to control bacteria growth. Remember to rinse the tanks thoroughly after cleaning. Sap in the storage tank must be kept cool until it is boiled. To do this, place the tanks or pails in a shaded area and bank snow up around them.

## *How Long Before You Boil The Sap?*

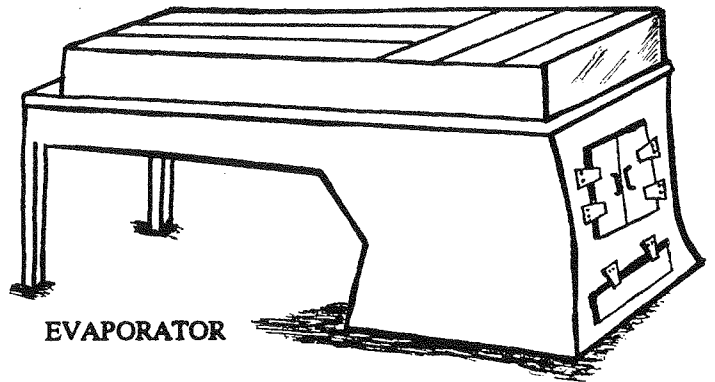
Producers try to boil the sap the same day it is collected. The sooner, the better. Fresh sap makes better syrup. Sap kept for longer than one day may start to sour. Warm weather may speed up the souring process. Beware!

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### **BEFORE THE NEXT MEETING**

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Examine some board games, trivia games, game shows or books with mazes. Get some ideas for creating a game about maple syrup production. Bring your ideas to the next meeting.

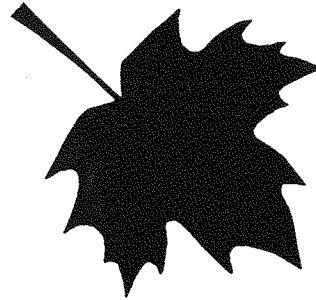


EVAPORATOR

# Bubbling Gold

## *Roll Call*

Descriptive words are words that tell us how something looks, sounds, tastes, smells or feels. Using descriptive words, describe one thing involved in maple sugaring (eg. the taste of maple syrup, how tree bark feels, how boiling sap smells, etc.).



## *Making Syrup On A Small Scale*

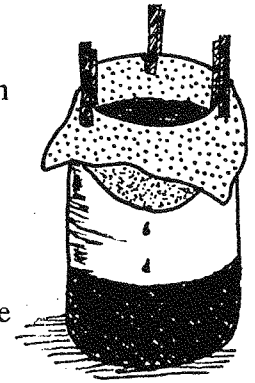
As you know, making maple syrup involves evaporating a lot of the water found in sap. You might like to try your hand at making a small amount of syrup. The instructions below should help you out. Remember to read all of the instructions before starting anything.

1. Go back to the "Producers Kick The Bucket" meeting to find out about collecting and storing sap. Follow these instructions with care. Sap can spoil!
  - candy thermometer and/or sugar hydrometer;
  - long handled ladle;
  - vegetable oil or butter;
  - 1 clean, wide mouthed bottle or jar;
  - piece of felt or soft clean cloth, well rinsed with hot water, that will fit over the mouth of the jar;
  - clothespins (4 or 5);
  - clean jars or bottles.
2. Pick a place to boil the sap. It is best to make maple syrup outside over a fireplace, an old wood stove, a propane stove or a barbecue. Making syrup indoors over a kitchen stove is not recommended. A great deal of steam is produced during boiling and a sticky film will develop on anything the steam touches. An overhead fan will help, but can get clogged by the sticky steam. If you do try to make syrup inside, open the windows.
3. Gather the equipment to make the syrup. You will need the following:
  - sap (30-45 L of sap to make 1 L of syrup);
  - some sort of stove or fireplace and fuel;
  - large pan or kettle;
4. Did you know that the boiling point of water changes if the air pressure changes or if you boil water at a high altitude? Before beginning, test the boiling point of water for the day. To do this you will need to boil some water over the stove. Use a candy thermometer to take the reading. Take the reading when the water comes to a steady rolling boil. Add 4°C to this reading. This is the temperature you want your syrup to reach.
5. Now, start the stove or fire. You need to have a hot fire that will boil the sap

quickly. You also need to keep the temperature steady. This means you will have to keep a close eye on the fire, adding more wood when it is needed. Boiling the sap too slowly will affect the colour, taste and texture of the syrup.

6. Don't put an empty pan over a heat source. This will burn or scorch the pans. It is best to put some sap in the kettle before placing it over the hot fire. Then, fill the pan or kettle the rest of the way. Don't fill it too full or it will boil over. Keep adding fresh sap as the water boils off. Remember, it will take 30 to 45 litres of sap to make one litre of syrup.
7. Boil the sap. Use the ladle to remove foam which rises to the top. To keep the liquid from boiling over, add a small dab of butter or vegetable oil. You can also add cold sap to the boiling liquid. This will cool the mixture.
8. Get out the thermometer when the sap starts to thicken. Check to see if the temperature is close to being 4°C above the boiling point of water. At this temperature the syrup should contain the right amount of sugar (66%). When the syrup reaches this exact temperature, you should remove the syrup from the heat at once. Syrup that is finished below this temperature will be too thin and won't keep. Syrup that is boiled to a higher temperature will form sugar crystals in the bottom of the jars.
9. Check to make sure the syrup has the right density (66.5 to 67 Brix), if you have access to a hydrometer or refractometer. (See the General Members' Manual page 19 to find out how to use a hydrometer. See below to find out how to use a refractometer.)

10. Now, filter the syrup. Filtering gets rid of sugar sand. Sugar sand are minerals which have formed into fine grains during cooking. Use the clothespins to pin the cloth or felt around the top of a wide mouth jar. Slowly pour the syrup onto the fabric. The syrup will drip through the fabric into the jar.



11. Pour the hot syrup into the clean jars at once. Make sure the temperature of the syrup is between 83°C and 93°C. Put on the caps and turn the jars on their sides. The heat sterilizes and seals the jar. Don't place containers of hot syrup close together. The syrup will get an off-taste called "stack burn."

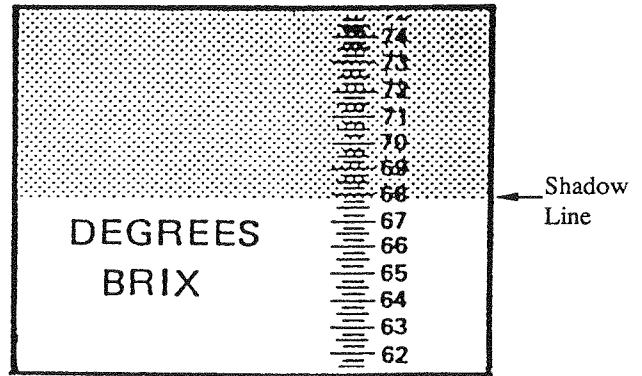
## *Using A Refractometer*

The main advantage of a refractometer is that you only need a drop of maple syrup to measure its density.

1. Place a drop of maple syrup on the refractometer's clean prism.
2. Close the cover and look to find the shadow line. This is the division point between the bright area and the shadow area. This is the uncorrected density of the syrup.
3. Take the temperature of the air. If the temperature of the air is **not** 20°C, you will need to adjust the density to account for this. Use a temperature correction table. You will have to add or subtract a certain number depending if the

temperature is above or below 20°C. This new number will be the true density of the syrup.

4. Clean the refractometer after a drop of syrup has been tested. Wipe the syrup off the prism with soft tissue paper. Then, wipe the prism with a cotton ball soaked with rubbing alcohol. Let the rubbing alcohol evaporate away.



## *Energy Savers In The Boiling Stage*

Fuel for evaporators is costly. Because of this, producers and scientists have invented new equipment and methods to save fuel.

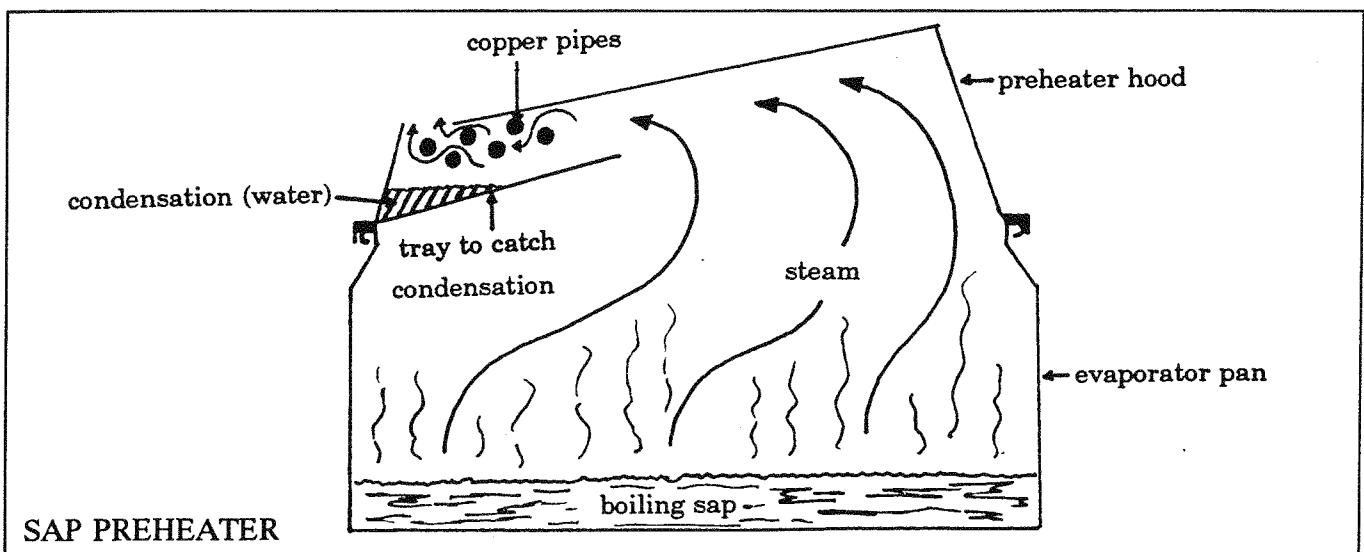
### **SAP PREHEATER**

As you know, a lot of steam is made when boiling sap. A preheater hood has been designed to use this steam. It uses waste steam to heat up cold sap before it gets to the evaporator.

There are two parts to the preheater. The first part is a metal hood which covers the evaporator pan. This hood collects the rising steam as it escapes from the boiling sap. Within the hood there is a coil of copper pipes. These pipes carry the cold sap from the storage tank to the evaporator. As the sap

moves through the pipes, it is heated by the swirling steam. When the hot steam comes near the cold pipes, the steam condenses into little water droplets. There are metal troughs under each pipe to catch these droplets.

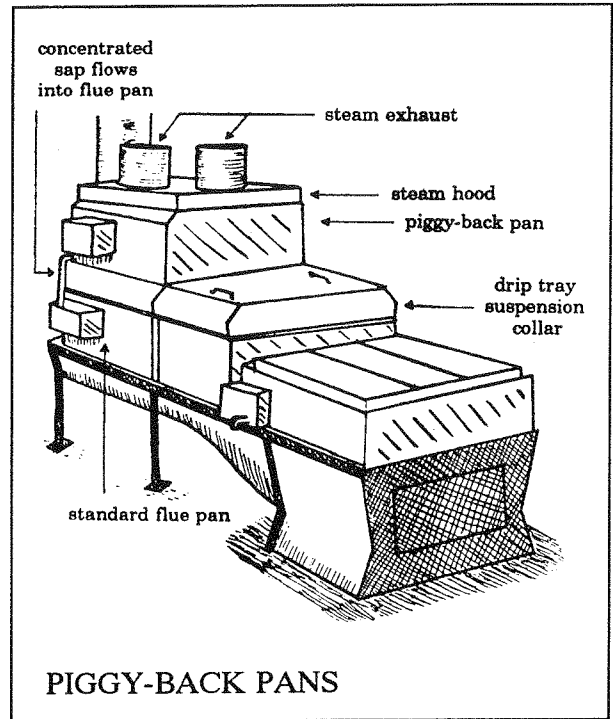
The sap preheater can raise the temperature of the sap from 2°C to 88°C. This saves 15 to 18% of the producer's time and fuel. The producer doesn't have to burn another source of fuel to get the sap to this temperature. Plus, the hot water that condenses into the troughs can be used to clean filters and other equipment.



## PIGGY-BACK PANS

The Piggy-Back Pan, a patented invention produced by Small Brothers, is placed above the flue pan. Sap is heated in the Piggy-Back Pan before going to the regular evaporator. Steam rising from the evaporator heats the sap. The Piggy-Back Pan has pipes running through it. An electric blower blows air through these pipes into the sap. The air bubbles rise through the water and pick up moisture as they escape into the air. This means that water is being evaporated before the sap reaches the regular evaporator pans. Thus, the Piggy-Back Pan not only heats the sap, it also condenses the sap. The sap preheater only heats the sap.

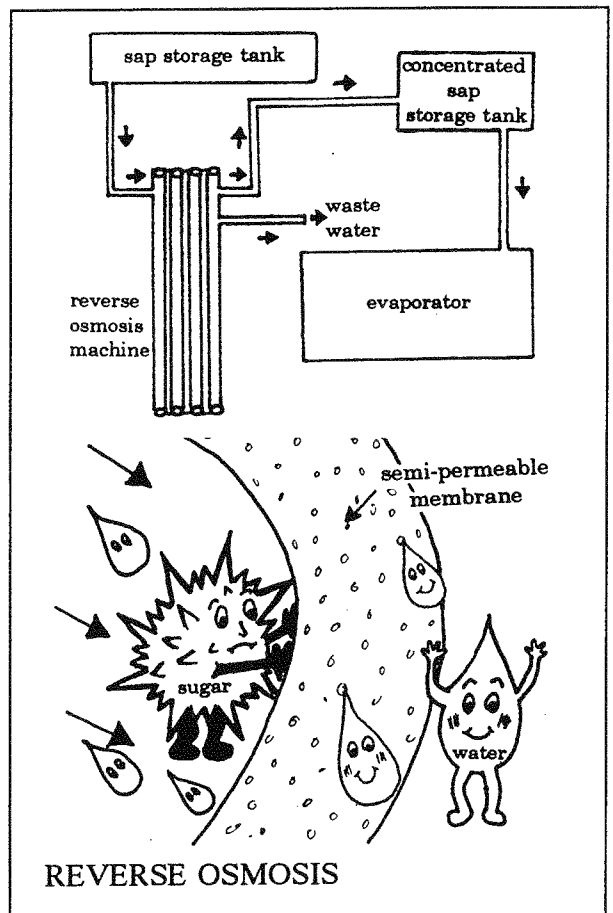
The Piggy-Back Pan is reported to process 65% more syrup with the same amount of energy.



## REVERSE OSMOSIS

Reverse osmosis is a process used to filter the sugar out of sap. The filters are semi-permeable membranes. A semi-permeable membrane has tiny holes or pores. These pores are big enough for water molecules to get through. Sugar molecules are larger than water molecules and cannot pass through the pores. The sap is pumped against the membrane at high pressure. Seventy-five percent of the water escapes through the pores. This is waste water. The rest of the water and sugar stays behind. This is the condensed sap which will be boiled in the evaporator. The process is called reverse osmosis because water normally moves towards areas where there is more sugar, not away from them.

The machine can be left on its own to work. Less money is spent on labour. Electricity runs the high pressure pumps, but fuel costs can still be reduced by 75% because the condensed sap can be made into syrup in a much shorter time.

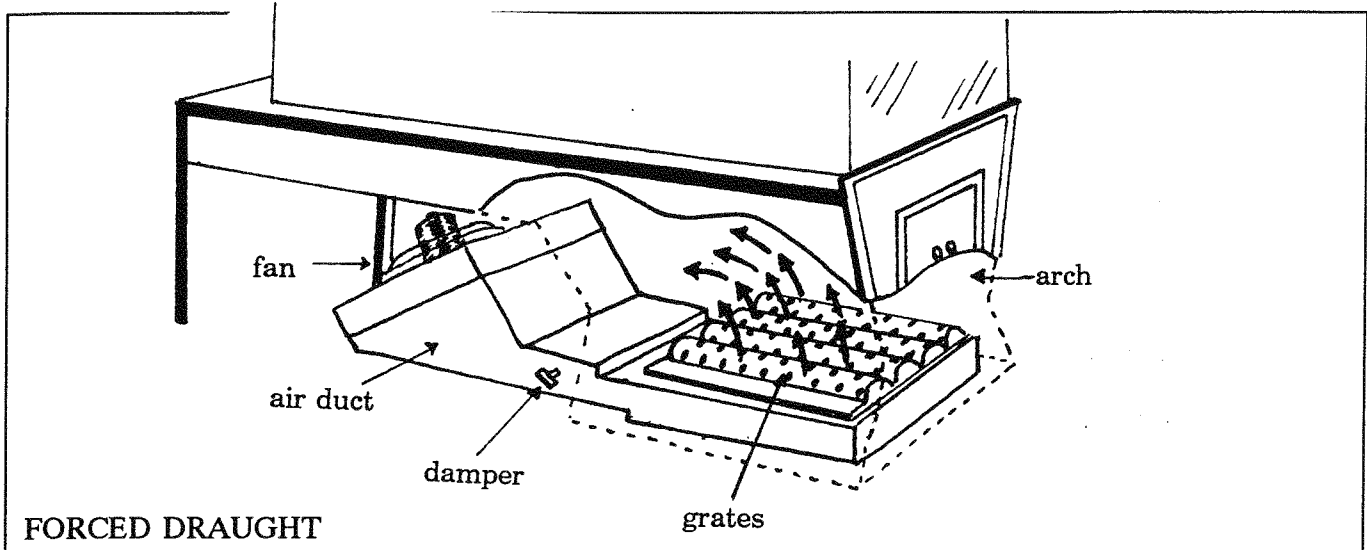




## FORCED DRAUGHT

You've likely found that blowing air on a camp fire helps to get it going. This is because fires need oxygen to burn. A normal evaporator uses a high smokestack and natural breezes to provide air for a hot fire. Now, electric fans are being used to move air to the fire. This helps on days when there is not a good breeze. The fan is put under the evaporator behind the arch. The fan directs the air through a metal duct to a space under the grates. Normally, a small door (called a

draught door) is used to control the amount of air getting to the fire. With the forced draft set-up, this small door is left closed. Instead, a damper is located in the duct. The damper can be moved to different angles to supply the fire with more or less air. The forced draught system seems to make a hotter, more constant fire. Since the fire is hotter, syrup can be made more quickly. It has also been claimed that forced draught helps a fire start more quickly. Finally, it has been reported that this system uses 50% less wood. Burning less wood means less ashes to shovel!

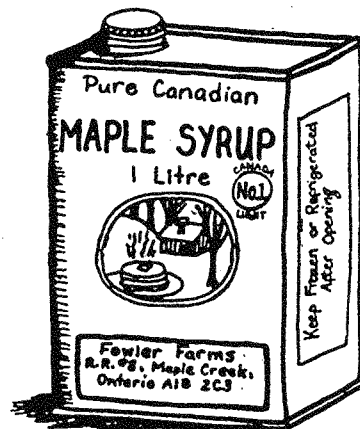


## BEFORE THE NEXT MEETING

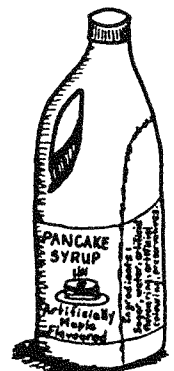
Market Survey: Ask three people you know if they like pure maple syrup or artificial table syrup better? Then, ask them why they like one or the other. Bring your results to the next meeting.

AND/OR

Bring pure maple syrup containers to the next meeting (if you volunteered for this job). Don't forget to find out how much the container of syrup costs.



OR



# Maple Marketing II

## *Roll Call*

Share your survey results with the club. Did the people you talked to prefer maple syrup substitutes or pure maple syrup?

## *Market Research*

A good sales person knows what his or her customers want and need. Then, he or she finds products to sell to them. Market research can help you do this. Market research means gathering information to help you decide what products you should make and how you should market them.

There are several ways you could do market research. You might just want to shop the market to see what is selling well and why. You could compare prices, containers, etc. Market research could be done by asking people to fill out a question sheet. Here are some possible questions.

- Do you buy pure maple syrup or artificial table syrup? Why?
- In what size of container do you prefer to buy syrup?
- How do use syrup? Would you like information on how to use maple syrup in recipes?
- What other maple products would you use?
- At what time of year would you buy gift packages of maple products?

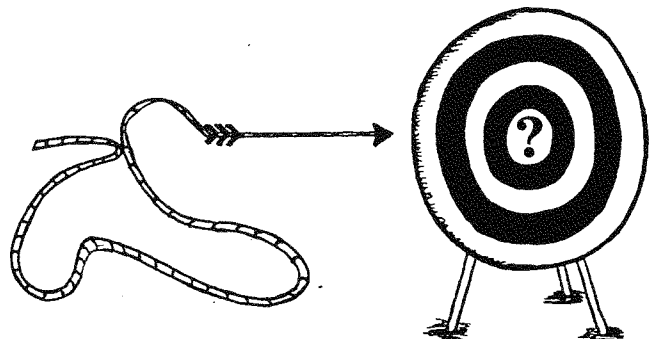
You could ask these same questions to people at the grocery store or ask them to comment on how well they like certain containers. Another way to do market research is to get a group of people together and ask them to comment on new maple recipes, maple products or advertisements.

You want to find out what appeals to your customers or potential customers. Then, you should make what your customers want and need. Finally, you should check to make sure that the new products, containers or advertisements are selling. You can do this by checking your sales records. If they aren't selling, then it's back to the drawing board!

## *Advertising*

### TARGETING YOUR ADVERTISEMENTS

You already know that one way to promote maple products is to advertise them. You need your ad to reach the right people, in the right place, at the right time. People call this targeting your advertisement. If you hit the bull's-eye, your ad will help sell your product.



The 5 Ws below will help you to target your ads.

**WHO:** Who are the people you want to reach? What do they like to do? How old are they? Do they live in the city or in a rural area? What is special about this group of people? Put yourself in their shoes. Plan your ad from their point of view.

**WHAT:** What is your message? What do you want to say about your product? Remember you want your maple product to stand out from the rest, but you also need to tell the truth. Can you think of some things that you could say about maple syrup?

**WHEN:** When should you show your ad? When is your target group going to be reading the paper – weekend or daily? When are they going to be listening to the radio – morning, evening or after school? What time of year should you be showing your ad – Christmas, spring, fall?

**HINT:** People will remember your product better if they see or hear your ads again and again.

**WHERE:** Where is your target group most likely to see or hear your ad? Here are a few suggestions.

- T.V. and radio
- newspapers and magazines
- billboards and posters
- flyers

You need to choose one or more of these. Then you need to choose certain radio stations or

newspapers. Will your target group be listening to a Rock 'n' Roll station or a Country station? What newspaper would they most likely read?

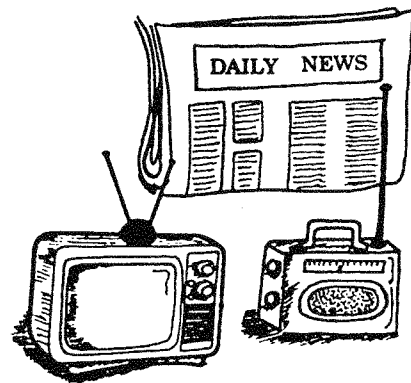
**WHY:** Why are you advertising? What are you trying to do? Will your ad help you do this? This is a good way to check your ad.

## SHARED ADVERTISING

In the fashion business, fabric makers, clothing makers and stores sometimes share the cost of advertising clothing. Could a maple syrup producer do this? Could they team up with a restaurant, pancake house or a local syrup festival?

## PUBLICITY

Publicity is a free kind of advertising. You don't have to pay for it. Newspapers or radios tell their audiences about things they think are important or interesting. If there is something special about a maple syrup farm, they might want to tell their audience about it. This doesn't cost a cent. Phone or write the media. Tell them about your farm and any special events. They just might report it! Don't forget to tell them the most important things: who you are, what the event is, where it is, when it is going to happen and why.

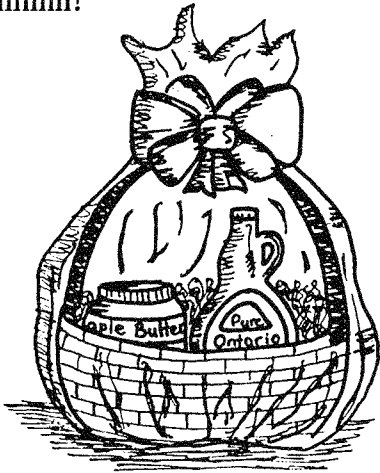


## *New Methods Of Marketing*

In the past, maple syrup was sold in the spring to local customers. But, now large farms are producing too much syrup to sell at the "farm gate." Because of this, producers are becoming creative sellers. Some new methods of selling maple products are Christmas marketing, companion marketing and special packaging. Some large farms are even trying to market syrup in other countries.

### **CHRISTMAS MARKETING**

Christmas is a time when people are often willing to spend money. This season is also famous for sweet treats. It makes sense to promote maple products as holiday gifts. Special gift packages decorated for the season are now being sold at Christmas time. Would you like a gift basket filled with maple treats? Mmmmmmm!



### **MARKETING AROUND THE WORLD**

We don't eat all the syrup made in Canada. Most of our syrup is sold to the United States. To increase sales, producers are looking for new markets around the world. The United Kingdom, Germany, Japan, Australia and France have become growing markets. The sweet taste of syrup has also been sent to Finland, South Korea, Hong Kong and

Thailand. Shoppers seem to be drawn to maple products because they link them with Canada. Ads and stores focus on this feature of maple syrup. How would you promote maple products in another country?



### **COMPANION MARKETING**

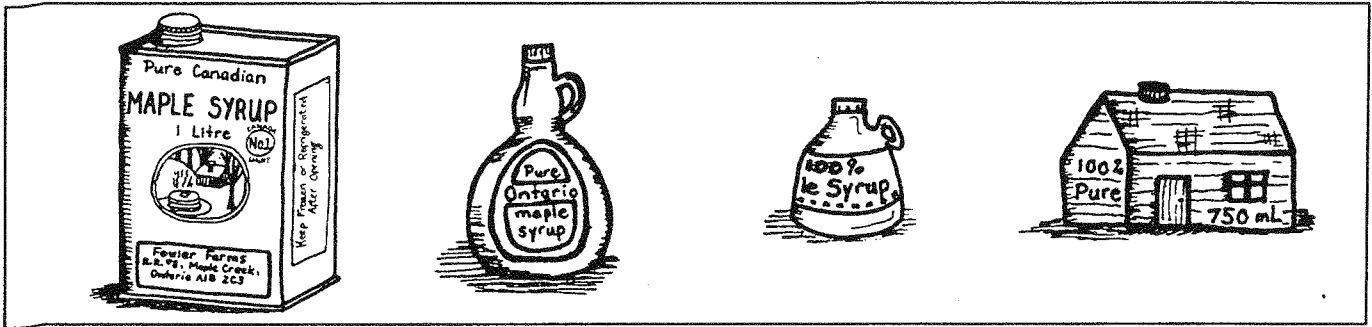
A companion is something that goes with or matches with something else. Maple syrup is being teamed up with various fruits and vegetables. Producers are promoting the use of maple syrup with grapes, peaches, strawberries, apples, pears, carrots, pumpkins, turnips and squash. They are hoping to sell maple syrup in the summer and fall when these foods are harvested. Watch for maple syrup and maple products at fruit and vegetable stands, farmers' markets and the produce section of your grocery store.



## PACKAGING

Most often syrup is sold in bottles or tins in many different shapes and sizes. Many buyers today like to purchase only small amounts of syrup. A customer pays more for a millilitre of syrup in a small container than a millilitre of syrup in a large container. Therefore,

the producer ends up making more money. Buyers are often willing to pay more money for syrup in unique containers. The packaging can make the syrup stand out from its competition. The container needs to look nice, but it also needs to be easy to carry, store and pour. The buyers want the best of both worlds!



## *Ontario Maple Syrup Producers Association*

In Ontario, the Ontario Maple Syrup Producers Association (OMSPA) works to promote maple products. OMSPA holds workshops and sends newsletters to inform maple syrup producers of new tools or methods for promoting maple syrup. The association also supports research on maple syrup. Maple syrup producers or people interested in the maple syrup industry can become members of OMSPA. Ask your leader for more details.

## *More Promotion Ideas*

Maple syrup producers advertise, but maple products are promoted in other ways as well. The following promotion techniques are used to attract buyers:

- maple syrup festivals;
- tours of maple syrup farms;
- maple syrup competitions (at local fairs and the Royal Winter Fair);

- maple syrup displays (at local fairs or ploughing matches);
- consumer education (eg. recipe and storage suggestions in pamphlets);
- taste testing maple recipes and products;
- word of mouth – happy customers come back again and again and pass the word onto their friends.

Is there anything else maple syrup producers could do? How about gift wrapping, home delivery, raffles or even sending invitations to customers? Have you got any other ideas?

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## **BEFORE THE NEXT MEETING**

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Look through some recipe books. See if you can find some recipes that use maple syrup. Could you add maple syrup to other recipes to make them taste better or more unique? Bring your recipe ideas to the next meeting.

AND

Bring your assigned recipe ingredients and/or equipment to the next meeting.

# From Tree to Table

## Roll Call

Share two or three recipes in which you think you could use maple syrup. Then, as a club try to group the recipes according to how the maple syrup is used (eg. sweetener vs. glaze vs. sauce or main dish vs. dessert vs. snack, etc.).

## Food Products Containing Maple Syrup

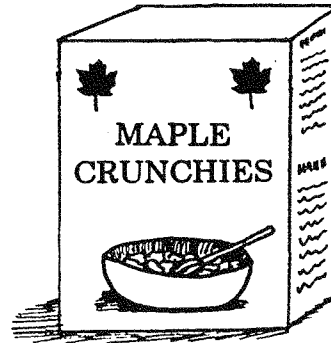
Maple producers are attracting more buyers by making unique maple food products. They are trying to appeal to every buyer's tastes and needs. For instance, producers have developed salad dressings and dip mixes to use with vegetables and fruits. These dressings and mixes attract people to maple displays at summer and fall fairs. Once they get there, the buyer might purchase a dip mix and some pure maple syrup too!



Some large producers are paying other people to make things like ice cream, breakfast cereals, maple mustard and maple peanut brittle. Then, the farmers market the products



alongside their syrup. Can you think of other food products that would taste good with maple syrup in them? Try looking through cookbooks to get some ideas. Bounce your new food ideas off your friends. If they think it sounds good, you might be the creator of a new maple food product. Good Luck!



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## BEFORE THE NEXT MEETING

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Make final preparations for the Achievement Program. You are responsible for:

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Achievement Program Details:

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Place: \_\_\_\_\_

AND

Complete your Special Activity if it is not already done.

**RECIPE LOG**

Date \_\_\_\_\_

Today, my club made the recipes listed below.

<b>Recipe</b>	<b>My Comments</b>

\*\*\*Put a star beside the recipe(s) you helped to make.

The most delicious, mouth watering recipe was:

\_\_\_\_\_