

Maple Syrup Digest

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September 2020



Allergens in Maple State Regulations Sap Flow



The Newsletter of the North American Maple Syrup Council





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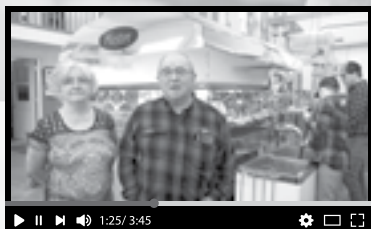
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MAPLE SYRUP DIGEST

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Greetings from your President



Normally at this time of year many of us would be busy making plans to attend our state or provincial fall meetings and tours, as well as the NAMSC/IMSI Annual Convention in October. Instead, it seems that every week we are clearing our calendars of another event that has been canceled. In Michigan, we recently canceled our Fall Tour that was scheduled to be in the Western Upper Peninsula the middle of September.

I have become well acquainted with Zoom meetings and find I prefer them to conference calls, however in-person is still my preferred method of meeting. Your delegates and executive board have been meeting regularly and recently have transitioned to Zoom meetings. Our annual meeting will be held via Zoom on Thursday, October 22 at 6:00 pm. More details will follow as we develop our agenda for the meeting.

This will definitely be a different type of annual meeting where instead of seeing everyone in person we will be looking at each other on a screen. Our annual meetings are when we visit with those once-a-year acquaintances who over the years have become friends, and where we share stories of the past season and what adventures each of us had in the woods. We learn new things about our industry and see the newest equipment. Now we're sharing ideas of what works or doesn't work through email, phone calls or other technology – which many are very comfortable with

(and the rest of us are getting there).

I hope many of you took advantage of the webinar on June 17-18, Assessing New Markets in this Time of Uncertainty. This was developed jointly with Ohio State University, Penn State University, and Future Generations University WV, and funded through an Acer grant and was free for maple producers to view. There were many great ideas for new ways to market our maple products along with what the future may look like for direct sales to customers. Also included was a section on business and finances. The webinar is available to be viewed at any time by going to www.future.edu/maple. Once there, scroll down to topic where you will find links to both sessions.

Take care, everyone.

Debbi Thomas
NAMSC President



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Seeking Photos

We're always looking for good maple photos for the *Digest*. Send to mapledigest@gmail.com.

Cover photo: Cranston's Tree Farm, Ashfield, MA.



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Allergens and Maple Syrup Production

Kathy Hopkins, University of Maine Cooperative Extension, author

Beth Calder, Ph.D., University of Maine School of Food & Agriculture and University of Maine Cooperative Extension, reviewer

Processing maple syrup into value-added products can increase product diversity, sales and producer profits. When considering the variety of potential value-added products, such as salad dressings, coated nuts, seasoning products, and sauces, it is important to evaluate the ingredients for their allergen risk potential and add the proper allergen statements to food product labels. This will ensure that you produce quality products and protect potentially susceptible consumers.

According to researchers,¹ approximately 32 million people in the US have food allergies and food allergies among children have risen by 50% between 1997 and 2011.² The US Food Allergen Labeling and Consumer Protection Act was passed in 2004 and requires that food be labeled with the identity of eight major food allergens. This labeling is a critical part of a HACCP plan and the control of allergen cross-contact is required in the revised Food and Drug Administration's Current Good Manufacturing Practices for food producers and the Food Safety Modernization Act, Preventive Controls for Human Food rule. It is important for maple producers to understand how food allergies may impact their products and production practices.

While people have reported allergies to more than 170 different

foods, the US Food and Drug Administration recognizes eight major allergens:³ milk, egg, peanut, tree nuts, wheat, soy, fish, and crustacean shellfish. An allergy to sesame is also under review. Health Canada lists 12 allergenic foods of concern:⁴ crustaceans and mollusks, eggs, gluten, milk, mustard, peanuts, fish, sesame, soy, sulphites, tree nuts, wheat, and triticale. The European Union lists 14 food allergens:⁵ cereals containing gluten (wheat, barley, rye, etc.), crustaceans (prawns, lobster, crabs and crayfish), eggs, fish, peanuts, soybeans, milk, tree nuts, celery, mustard, sesame, sulfur dioxide, lupin, and mollusks.

Allergens arise from foods that contain allergenic proteins, which are natural constituents of the food. These proteins can pose a health risk to sensitive individuals. Some food components that are not technically proteins, such as sulfites, can also cause symptoms similar to allergenic proteins. Food allergy symptoms can include tingling sensations in the mouth, a swelling of the tongue and throat, nausea, difficulty in breathing, chest pain, hives, rash, itchy skin, vomiting, abdominal cramps, diarrhea, anaphylactic shock, and sometimes even death. Food allergy symptoms often develop suddenly, can be triggered by only a small amount of food, and can happen whenever that food is eaten. The symptoms are the

result of the immune system reacting to a specific food or an ingredient in the food. In many cases an allergenic protein may be derived from a food that is then used as an ingredient in the preparation of another food product. Salad dressings often contain allergenic proteins such as casein, lactose, and whey, which are derived from milk. Dried egg yolk powder may be found in salad dressings and pancake or waffle mixes. Cooking oils may be a hidden source of allergens if they are made from peanuts, soybeans, canola or sesame. These oils may be an ingredient in barbecue and condiment sauces of various types.

Consumers with food allergies must avoid those specific allergens to prevent potential life-threatening reactions. According to the Food Allergen Labeling and Consumer Protection Act, undeclared food allergens are considered chemical hazards. They can be accessed by consumers in food if manufacturers do not declare the allergenic ingredient on the product label. Allergens can also be included in foods due to cross-contact that occurs during preparation. It is important to note that cross-contact and cross-contamination are different aspects of food safety. Cross-contact occurs when proteins are transferred from one food to another food that does not normally contain the protein/allergen. Cross-contamination occurs when bacteria from one food product is transferred to another. Both cross-contact and cross-contamination can be adequately addressed by following good manufacturing practices and utilizing proper sanitation

procedures.

According to the final rule of the Food Safety Modernization Act, food allergen controls are written procedures a food manufacturer implements to control allergen cross-contact and the controls must ensure that allergens are listed correctly on the labels of packaged food products.

Allergen control programs to prevent cross-contact include some of the following Good Manufacturing Practices (GMPs) and Standard Operating Procedures (SOPs).

- Raw materials containing allergens are properly labeled and stored separately or below other food items to prevent contamination by accidental leakage by allergenic raw materials.
- Scheduling the timing when allergen containing ingredients/foods are placed into production to avoid potential cross-contact (for example, the last production run of the day).
- Procedures are in place to ensure complete removal of allergens from the processing area followed by strict cleaning procedures of all food contact surfaces.
- Documenting and recording the procedures used to control and prevent cross-contact.

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- Ensuring the proper label/packaging is placed onto the finished product.


Records that can show your efforts to eliminate allergen cross-contact include:

- A written food safety plan that includes: a hazard analysis of the production process, development of preventive controls, development of a recall plan, and monitoring of potential hazard points, corrective actions, and process verification procedures.
- Implementation records may include: monitoring records,

corrective action records, validation documentation, calibration records, verification activity records, supply-chain management, and personnel training (including sanitation training records).

Some verification activities you should be employing include:

- Identifying, marking and/or color-coding allergen-containing ingredients when they are received.
- Storing allergen-containing materials separately.
- Scheduling production of products based on allergen-



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containing recipes and cleaning thoroughly all production areas and tools after the production process.

- Separate processes and/or facilities for non-allergen and allergen-containing products.
- Using dedicated cleaning utensils and equipment for allergenic products and identifying them by color coding.
- Reviewing each new batch of labels when received to ensure correct labeling of allergens. The wording for a “Contains” statement may be limited to just stating the word “Contains” followed by the names of the food sources of all major food allergens that either are in or are contained in ingredients used to make the packaged product.
- Training staff on quality assurance processes for applying the correct label to the correct product.

Allergen Labeling Statements

To provide full disclosure to consumers, most jurisdictions require some form of allergen labeling on packaged foods. The Food and Drug Administration (FDA) regulates allergen statements for the United States. To declare major food allergens, a statement should begin with the word “Contains” followed by the food allergens present in the same type and font size as the ingredient

list. The “Contains” statement must identify the names of the food sources for all major food allergens that either are in the food or are contained in the ingredients of the food.⁶

In Canada, the Canadian Food Inspection Agency provides requirements for food allergen labeling on packaged foods. Producers may either label the individual foods in the ingredient list with the allergens they contain or provide a separate list of allergens using a “Contains” statement on the label. Producers may also include a precautionary cross-contamination statement “May Contain” when a food allergen may unintentionally be present in the food even when employing good manufacturing practices.⁷

In the European Union, Article 21 of Regulation (EU) No 1169/2011 requires that allergens be declared in the list of ingredients where the name of the substance has to be emphasized through a typeset that clearly distinguishes it from the rest of ingredients, by means of the font, style or background color. If there is no list of ingredients, the allergens must be indicated by using the word “contains” followed by the name of the food allergen. The allergens declaration is also mandatory for foods offered for sale to the final consumer or to mass caterers without prepackaging, or where foods are packed on the sales premises at the consumers' request or prepacked for direct sale.⁸

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Definitions

Cross-contact: The unintentional incorporation of undeclared allergens into foods that are not intended to include those allergens. Cross-contact can occur either between foods that contain different food allergens or between foods with and without food allergens. Introduction of an allergen through cross-contact may occur during receiving, handling, processing and storage of ingredients and foods, utensils, and packaging; through improper handling and cleaning of equipment, utensils, and facilities; and through improper facility design.

Food allergen: A major food allergen as defined in section 202(2)⁹ of

the Federal Food, Drug, and Cosmetic Act.

Food-contact surfaces: Any surface that contacts human food during the normal course of operations. “Food-contact surfaces” includes utensils and food-contact surfaces of equipment.

Preventive controls: Risk-based, reasonably appropriate procedures, practices, and processes that are employed for the safe manufacturing, processing, packing, or holding of food to significantly minimize the potential hazards identified under the hazard analysis; the preventive controls must be based on current scientific data of safe food manufacturing practices, such as processing,



packing, or holding foods, and may require a validation study.

Where Are Allergens Found?

Crustacea: includes shrimp, krill, crab, lobster, prawn, and crayfish.

Egg: egg white (albumin) egg yolk, powdered eggs, mayonnaise, egg solids, and many pasta varieties.

Fish: bass, cod, flounder, tuna, salmon, Worcestershire sauce, fish sauce, imitation fish or crab, salad dressings.

Milk (Dairy): milk caseins, whey and whey powder, butter, cream, cottage cheese, yogurt, lactose, caseinates, cheese, lactose, half and half,

buttermilk, and sour cream.

Peanut: peanuts, peanut flour, peanut protein, hydrolysate, goobers, beer nuts.

Soy: soy, edamame, miso, natto, tempeh, tofu, soy milk, soy cheese, soy yogurt and soy ice cream, tamari and other soy sauces.

Tree Nuts: almonds, Brazil nuts, cashews, filberts/hazelnuts, macadamia nuts, pecans, pine nuts, pistachios, walnuts, almond paste, pesto, nut meal, shea nut, coconut and pine nuts.

Wheat: wheat, barley, oats (that are not listed as gluten-free), rye,

Allergens: continued on page 15



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Syrup producers take note! There are some suppliers promoting and selling *seedlings* of high-content parent trees; only vegetative cloning (tissue culture or cuttings) will reliably pass on the high sugar content trait to offspring!

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spelt, bulgur, flour, wheat gluten, malt, wheat germ oil, matzoh, durum, couscous, Kamut, wheat bran and wheat gluten.

Sesame: sesame, tahini, gingelly, til seeds, benne, benniseed, and some cosmetics.

Sulphites (Sulfites): sodium/**potassium** sulfites, potassium or sodium bisulphates/metabisulphites (bisulfates/metabisulfites), sulfur dioxide, sulphurous/sulfurous acid, and sulphiting/sulfiting agents.

Mustards: mustard, mustard seed, canola meal, canola oil; can include some of the following condiments/foods: sauces, pickled products, salad dressings (including vinaigrette dressings), dehydrated mashed potatoes, soups, and marinades.

For More Information

Allergens USDA FSIS – Food Safety Inspection Service – PDF download

<https://www.fsis.usda.gov/wps/wcm/connect/f9cbb0e9-6b4d-4132-ae27-53e0b52e840e/Allergens-Ingredients.pdf?MOD=AJPERES>

Developing an Allergen Control Program – Canada PDF download

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FSMA Preventive Controls for Human Food

<https://www.fda.gov/food/food-safety-modernization-act-fsma/fsma-final-rule-preventive-controls-human-food>

Food Allergen Labeling and Consumer Protection Act 2004

<https://www.fda.gov/food/food-allergensgluten-free-guidance-documents-regulatory-information/food-allergen-labeling-and-consumer-protection-act-2004-questions-and-answers>

Food Allergens/Gluten-Free Guidance Documents & Regulatory Information

<https://www.fda.gov/food/guidance-documents-regulatory-information-topic-food-and-dietary-supplements/food-allergensgluten-free-guidance-documents-regulatory-information>

Food Information to Consumers (EU)

https://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation_en

How to Label Allergens on Your Food Product Canadian Food Inspection Agency

<https://www.inspection.gc.ca/food-label-requirements/labelling/industry/how-to-label-allergens/eng/1462469921395/1462472833650>

Allergens: continued on page 16

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State Regulations for Maple Production

Andrea Caluori

Cottage food laws allow individuals to make food in a home kitchen and legally sell it at certain venues to the public. These laws largely came into effect in the early 2000's during the Great Recession as an alternative way for people to earn income by safely selling products they make at home. Particularly as the demand for local food has become more popular, cottage food operations have increased.

Cottage food laws vary considerably from state to state, and are generally intended to be a way for small farmers and food processors to establish small businesses offering value-added food products. Some states require food producers to pay a fee, obtain a permit or license, or register with the town, county or state. Periodic health inspections of home kitchens and even product testing may also be required depending on location.

A great resource for small-scale farmers interested in starting a cottage food business is the website www.forrager.com. The site provides a map that allows users to click on any state and learn about its cottage food laws. It includes a brief summary of each state's laws and their history, and offers sections that outline selling regulations, limitations, business, labeling, and permitted foods. The resources section provides important details such as which state agency oversees cottage food laws, along with their contact and relevant legal information. Most infor-

mation is kept up to date.

Forrager has also compiled resources for those interested in starting a cottage food business. The site's podcast series interviews cottage food business owners in the U.S. about how they started their business, challenges they faced and the ins and outs of their operations. There are also online community groups and state forums for idea sharing and questions. The site is comprehensive and worth dedicating time to explore for those considering starting a cottage food business.

Maple syrup is not considered a cottage food, but rather an agricultural product, with regulations for production and sale determined at the state level, just like cottage food laws. Regulations vary widely from state to state. Maine, for example, requires that sugarhouses be licensed and inspected, and that they follow strict regulations for everything from sanitation to labeling. Many other states have no regulations at all, beyond the labeling requirements that are standard for all food that require accurate weight or volume measurements along with source identification and contact information for the producer (see labeling requirements at <https://mapleresearch.org/pub/m0616labelingrequirements/>).

Once syrup is made into a value-added product – such as cream or candy – or used as an ingredient in another

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Regulations: continued from page 17

food item – such as dressing or granola – the applicable regulations usually change from being under the purview of the state agricultural agency, to that of the public health agency. Anyone processing maple in any way beyond fluid syrup should familiarize themselves with their state’s regulations, and determine whether the products they are making are allowed under the cottage food laws (if there are any) or must follow the stricter set of regulations for commercial food processing.

While there is no website similar to Forrager that provides a comprehensive overview of maple sales regulations, producers can research their state’s laws concerning maple production and sales through their local cooperative extension program, producers association, and the appropriate overseeing state department.

The list on the following pages offers a brief overview of maple production laws in many states. Sugarmakers should contact their appropriate state agency for further guidelines on selling maple products, or inquire with their state association about available resources. Many of the websites listed offer important and detailed information such as guidelines around sanitation, packing, grading and labeling maple syrup, as well as any further licenses and requirements needed for the making and selling of value-added maple products.

Finally, remember that the federal Food Safety Modernization Act of 2011 requires registration of food manufacturing facilities, including sugarhouses. A past article in the *Maple Syrup Digest* details those requirements: <https://mapleresearch.org/pub/m0617fsma/>.

MAPLE RESEARCH.ORG

NORTH AMERICAN MAPLE SYRUP COUNCIL



NAMSC has launched mapleresearch.org, a new online resource for the maple industry.

The site is a curated collection of research papers, articles, videos, and tools, representing the most current and scientifically accurate information for maple production, to help all producers make the best products possible using the most current and most sustainable practices.

From *Maple Syrup Digest* articles, to producers’ manuals, to how-to videos, the site includes a collection of the best

resources available online about all aspects of maple syrup production, at no cost. The site is searchable, and resources can be downloaded and printed.

The site was built in collaboration with the University of Vermont’s Proctor Maple Research Center, and funding was provided by the U.S. Department of Agriculture’s (USDA) Agricultural Marketing Service.



State Licensing/Inspection Regulations

The following brief summaries of state regulations is not legal advice, and regulations change often. Follow the links or check with your state association for details and current rules.

Connecticut

Agency: Department of Agriculture
License/Permit required: No, though regulations are currently being revised.
Inspections: Voluntary Inspections by State Department of Consumer Protection for sugarhouses that sell directly to the public.
Link: <https://bit.ly/34Rv6mG>

Indiana

Agency: Department of Health
License/Permit required: No.
Inspections: Inspections by local authorities recommended, but not required.
Link: <https://bit.ly/31S3gVq>

Maine

Agency: Department of Agriculture, Conservation and Forestry
License/Permit required: Yes, a range of licenses are required depending upon how products are sold.
Inspections: Yes.
Link: <https://bit.ly/2EAJUeN>

Massachusetts

Agency: Department of Agricultural Resources
License/Permit required: No.

Inspections: No.
Link: <https://bit.ly/31JZnln>

Michigan

Agency: Department of Agriculture and Rural Development
License/Permit required: Exempt from licensing if gross sales are \$15,001 or less. Producers must follow same labeling requirements as cottage food products and must meet all requirements of Michigan Food Law.
Inspections: Not required if gross sales are \$15,001 or less.
Link: <https://bit.ly/2QCIZN4>

Minnesota

Agency: Department of Agriculture
License/Permit required: Yes, unless all sap is obtained from trees on your own land and no other “off farm” inputs are used in your operation.
Inspections: All maple operations in Minnesota are subject to inspection by the MN Dept. of Agriculture.
Link: <https://bit.ly/2DeDb9q>

New Hampshire

Agency: Department of Agriculture, Markets & Food
License/Permit required: No. Voluntary registration program.
Inspections: No.
Link: <https://bit.ly/32KvJeO>

Regulations: continued on page 20

New York

Agency: Dept. of Ag. and Markets

License/Permit required: No, if you do not purchase from others for repackaging and if appropriate guidelines are followed.

Inspections: No.

Link: <https://bit.ly/3lDhLEc>; <https://on.ny.gov/2EVRfFd>

Ohio

Agency: Department of Agriculture

License/Permit required: Not required if boiling sap when a minimum of 75% of sap used to produce syrup is collected directly from trees by same processor.

Inspections: Not required if boiling sap when a minimum of 75% of sap used to produce syrup is collected directly from trees by same processor. Voluntary inspection available.

Link: <https://bit.ly/3begdvV>

Pennsylvania

Agency: Department of Agriculture

License/Permit required: Yes. \$35. Inspections: Yes. Inspection required for any item entering commerce.

Link: <https://bit.ly/3gLG92M>

Rhode Island

Agency: Department of Health

License/Permit required: Permit and registration required. This permit allows farmers earning over \$2,500 in agriculture products throughout the year to produce food from home. They need to meet all requirements outlined in the Food Farm Home

Manufacturer law.

Inspections: Unclear, but appears so during permitting process.

Link: <https://bit.ly/31UqIRZ>; <https://bit.ly/3lL36qO>

Vermont

Agency: Ag., Food & Markets

License/Permit required: Yes. A dealer interested in selling maple must obtain a license for a fee of \$30 through the Secretary

Inspections: Yes. VT maple dealers are subject to inspections.

Link: <https://bit.ly/34QKcIQ>

West Virginia

Agency: Department of Agriculture

License/Permit required: No. Producers are asked to register with the WV Department of Agriculture, but maple syrup is listed as an allowed food under WV cottage food law.

Inspections: Not required.

Link: <https://bit.ly/3gPONGj>

Wisconsin

Agency: Department of Agriculture, Trade and Consumer Protection

License/Permit required: Maple syrup processors are required to register their business at no cost. There are licensing exemptions for wholesale and selling directly to a consumer. Backyard producers selling directly to consumers do not need a retail food establishment license.

Inspections: Refer to Dept. of Ag., Trade and Consumer Protection's Rules for Maple Syrup Processors.

Link: <https://bit.ly/3bhTcrJ>



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The Importance of Drought Stress and Water Availability for Maple Sap Production

David Moore, University of New Hampshire graduate student

Sap flows in many trees during the winter dormant season when they are leafless. During the growing season, sap flow is driven by evapotranspiration, and water moves from the soil through trees' vascular systems and evaporates through open stomates in the leaves. During the dormant season, no such mechanism exists, and other physical and biological processes drive sap flow. To understand why sap flows during winter dormancy in many species of trees, it is important to understand embolisms.

Embolisms are air bubbles that form in a tree's xylem (the vascular tissue responsible for water transport) during periods of water stress. A continuous column of water throughout a tree's xylem is necessary for the upwards movement of sap during the growing season – water moves via cohesion and adhesion through xylem vessels and tracheids following the water potential gradient that exists between the soil and the atmosphere. If a tree is under water stress and water is lost by the leaves faster than it can be replaced from the soil, this continuous column of water can be broken when gas that is dissolved in sap comes out of solution and forms bubbles in vessels and tracheids. These air bubbles, or embolisms, essentially block the flow of water through the xylem, and if too many of them form, it can have serious consequences for the tree's health.

Under moderate water stress, plants can usually limit embolism formation by closing their stomates, but some embolisms will inevitably form during the course of even a normal growing season. Embolism repair mechanisms that occur during dormancy cause sap to flow into regions of the xylem that have embolized, and in some cases (like in maples), they can cause large pressures to build up inside stems ('stem pressure'). It is these sap flow and pressure-building events that allow sugarmakers to harvest sap for syrup production.

During winter dormancy, sugar maple sap flows are greatest during freeze-thaw cycles. The anatomical and physiological mechanisms that allow this sap flow and pressurization to occur are complex and nuanced. According to the ideal gas law, gas expands as temperatures increase and shrinks as temperatures decrease. When temperatures drop and gas bubbles shrink, sap from surrounding areas moves towards the embolisms to fill the space they once occupied. When temperatures rise, embolisms expand, which puts pressure on the nearby sap and causes it to move away from the embolism again. If enough sap flow occurs to build up significant pressure, gas bubbles can actually redissolve into the sap. A well-written, more thorough, and current explanation of this process was published in 2015 by Graf et al.

Sap: continued on page 25



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Since embolisms are so important in driving maple sap flow during the winter dormant season, it is possible that trees that experience more water stress during the growing season (and consequently develop more embolisms) may be capable of generating larger stem pressures and greater sap flows than trees that were not water stressed. Furthermore, greater sap flows may occur at sapwood depths that contain more embolisms. Deeper sapwood depths contain older wood which has undergone more periods of water stress than younger, shallower wood, but these deeper, older hydraulic conduits have also undergone more periods of embolism repair, so it is unclear which sapwood depths contain the most embolisms. On the other hand, since shallower sapwood depths experience more freeze-thaw cycles than deeper sapwood depths do, shallower sapwood depths may experience more sap flow events during winter dormancy regardless of where most embolisms are found. Though radial sap flow profiles have been generated for sugar maples during the growing season (Caylor and Dragoni, 2009; Dragoni et al., 2009; Pausch et al., 2000), radial sap flow profiles during winter dormancy are lacking. Since the mechanisms driving sap flow differ between the growing season and the dormant season, the depth of maximum sap flows may differ between the two seasons as well. The studies that have measured sugar maple sap flow across different sapwood depths during the growing season have found that the maximum sap flows occur only about half an inch beneath the cambium.

Although embolisms (and possibly periods of water stress) are important for driving sugar maple sap flow during winter dormancy, water availability is clearly important as well. Without access to water during the dormant season, sugar maples would not be able to refill embolized hydraulic conduits. Furthermore, water availability during the growing season allows sugar maples to photosynthesize and synthesize the sugars that make maple sap sweet. Periods of water availability and water stress are both important for maple syrup production. It is the interplay between the two that generate strong stem pressures and allow for a bountiful harvest.

Works Cited

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Grade Blending: A New Calculator to Get Blended Syrup in Grade

Have you ever wanted to blend two syrups of different grades to meet your customers' needs?

The Cornell Maple Program has developed a new, user-friendly tool to calculate how much of each syrup you would need to blend. This calculator will only help sugarmakers using digital light meters that give the percentage of light transmittance (%Tc) through your syrup. It won't help if you use a visual kit. Let's go over the grades:

% Transmittance for each grade

Very Dark	0-24.9%
Dark	25-49.9%
Amber	50-74.9%
Golden	75-100%

It may seem counter-intuitive that as the syrup gets lighter in color, its %Tc number goes up. This is because the number indicates how much light is allowed to pass through the syrup. Think of Golden syrup as a white curtain, and Very Dark syrup as a thick black curtain. Which one allows more light to pass through?

To use the calculator, you will need to know:

- The %Tc of your lighter syrup
- The %Tc of your darker syrup
- The %Tc of a 50/50 blend of the two syrups (create a small sample that is half and half of each syrup, and combine thoroughly before measuring %Tc)
- The %Tc you want your final syrup to be, and how much you wish to make

This calculator produces a very close estimate, resulting in a blend that will get you within about 2 points of your goal. Additionally, all light meters carry some built-in error. To compensate, you should choose a target %Tc that is well within the grade you'd like to achieve. For example, if blending a Golden Syrup with a Very Dark to make Dark syrup, you should choose a target %Tc of somewhere between 35-40% to enter into the "desired %Tc" cell of the calculator.

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If you are using mobile phone, double tap the yellow cells to type.

Transmittance Blending Calculator

Instructions
Enter your data into the YELLOW highlighted squares like this:
Enter numbers only, no special characters or unit labels. Ex: your data 25.2

Lighter	Darker	
88.1	20.5	Enter the initial transmittance % you get for both of your starting syrups. The higher number (greater light transmittance) should go into the % lighter ^a column.
34	34	Enter the transmittance % of a 50/50 blended sample of your 2 syrups. Be sure they are mixed thoroughly. Allow bubbles to settle completely out before measuring %Tc. Bubbles in the cuvette reflect a lot of light, making your syrup read darker than it truly is.
35.6	35.6	Enter the %Tc you hope to achieve (desired transmittance)
		24.3 Variable A
		34 Variable B
		35.6 x
		0.859323 Ratio of Darker : Lighter syrup required
		40 The number of gallons you want to make at your desired %Tc
25.51321	18.4867	The # of gallons you should use to blend of each syrup.

Sample screen shot of blending calculator in use.

To make sure the calculator's results are as accurate as possible, there are a few steps you can take. Be sure to follow the instructions and calibration guidelines that come with your light meter. Also, make sure that any syrup samples you are measuring have had time to allow all bubbles to settle out. Be patient; this can take a while. Even tiny air bubbles reflect a lot of light, and therefore make your syrup read darker than it truly is. This tip is especially important for measuring the %Tc on your 50/50 blend – after thoroughly mixing the two syrups together, your sample will be full of air bubbles.

You may be able to get your syrup in grade by blending, but can you keep it in grade? New research is revealing that the traditional plastic jugs allow syrup to lose grade rather quickly after it has been canned. This is because the plastic has microscopic pores that allow oxygen to pass through. The oxygen induces a chemical reaction that causes syrup to darken, just like how an apple

browns after you bite into it.

But the traditional jugs are not the only containers that allow syrup to lose grade. In fact, the only packaging options that will protect your syrup from darkening are Glass and oxygen-barrier plastics such as the plastics commonly used for squeeze bottles. If you want to be sure your syrup is in grade for judging at a local or the state fair, you should can your syrup into these oxygen-proof materials, or be sure to can it a day or two before the event.

You can access the Grade Blending Calculator, and many others, at the new "Maple Calculators" page on the Cornell Maple Program Website. The documents can be downloaded for offline use, or used directly on the site, even on a mobile phone! Visit www.cornellmaple.com for a variety of maple resources and free materials.

HELP WANTED: Maple Foreman

Opportunity for full time employment as a working foreman for large scale maple syrup operation located in Montgomery County, NY. Job will primarily entail working in maple woods installing and repairing plastic tubing collection systems. Leadership skills will be needed to manage personnel and coordinate workflow. Drivers license and experience required.

We would be willing to train the right person for the job if needed but they must enjoy working outdoors in different weather elements (as needed), work independently, leadership qualities, and some mechanical ability required. An agricultural background is an advantage but not necessary. Housing would be available to the right candidate. Working weekends during the season (as needed) is very important.

Pay is based on experience. Work references and resume will be needed.

References and resume can be sent to: bruceroblee@yahoo.com Questions regarding employment or the job can be addressed via telephone: 518-853-4022 (business office) or 518-853-3987 (John Buccos/office manager).

Thank you to our Research Alliance Partners

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Maple Workshops Available Online

Though annual meetings and in-person workshops have been canceled throughout the maple region, researchers and extension agents have stepped up to make their resources available to sugarmakers remotely. Some of the resources available include:

UVM Maple Business and Forestry Series

UVM maple specialists will host a series of online webinars focused on business decision making and forestry practices. Learn about the best practices to integrate business management and sugarbush management for a thriving maple enterprise. <https://www.uvm.edu/extension/agriculture/maple/biz-modules/upcoming-events>

VT Maple Conferences

More than 20 hours of presentations from the 2017-2020 Vermont maple conferences are available online at https://www.uvm.edu/extension/agriculture/maple_conference

PMRC Videos

UVM's Proctor Maple Research Center has a YouTube channel with more than 100 videos, mostly on high-yield production. <https://www.youtube.com/c/UVMProctorMapleResearchCenter/playlists>

Maple Research

NAMSC's mapleresearch.org site has hundreds of articles, videos, manuals, and tools for sugarmakers, all available for free online.

Future Generations

Future Generations University in West Virginia has posted their "Accessing New Markets in this Time of Uncertainty" webinars online at <https://www.future.edu/maple/>.



NAMSC Annual Meeting Goes Virtual

With the cancelation of the October annual meeting and conference in Wisconsin due to the COVID-19 pandemic, the North American Maple Syrup Council will hold its annual meeting virtually, with delegates conducting business online. This session is when decisions are made about research funding, annual budgets, and other issues related to the operations of the Council.

The session will be held October 22 at 6:00 PM Eastern Time. It will be an open meeting, and login information will be shared through state and provincial associations before that time.

IMSI News

The International Maple Syrup Institute held a board of director's meeting on July 10, 2020. The following topics were among those discussed:

Added sugar labeling concerns

In July, the IMSI reviewed the USDA and HHS Scientific Report of the 2020 Dietary Guidelines Advisory Committee (DGAC). In response, IMSI sent testimony to the USDA.

The DGAC recommends limiting calories from added sugars to no more than 6% of daily intake. Current dietary guidelines for Americans recommends limiting calories from added sugars to less than 10% percent of daily total calories. For example, if you consume a 2,000-calorie daily diet, that would be 200 calories or 50 grams of added sugars per day.

The recommended change to no more than 6% would raise the daily value on maple syrup's US 30ml serving nutritional panel from 48% to about 80% which would potentially reduce consumption. The IMSI presented some objections to this proposal. One way of mitigating this possible change is to decrease maple syrup's serving size from 30ml (2 tablespoons) to 15ml (1 tablespoon) like honey and some other comparable sweeteners.

Standards of identity

In April 2020, the IMSI submitted comments related to the objective of modernizing standards of identity gen-

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erally, as well as issues related to the USDA Food Safety & Inspection Service and the HHS Food and Drug Administration's May 20, 2005 proposed rule. This effort is of importance for the maple industry and the IMSI, which is working to harmonize and extend the U.S. standard of identity for maple syrup with those of the various states. An IMSI task force is working on the maple syrup standard of identity so that consumers are protected against deceptive marketing schemes including the representation of products as maple when they contain little or any pure maple ingredients. The establishment of a uniform SOI for all maple products will be will help promote greater opportunities for nutritious maple innovation.

To this end the IMSI panel of maple science experts completed its analysis and commentaries and a first draft of the new proposed SOI was approved by the panel in July. The panel's comments provide comparisons between US state jurisdictions to gain a full understanding of the differences and eventually help with petitions to harmonize them. The IMSI's next step is to consult with maple business sectors (producers, packers, and equipment manufacturers), amend if required and then present to the IMSI board of directors. This is an important step in protecting maple producers from fraudulent imitations and deceptive misrepresentations.

COVID-19 impact on maple

IMSI board members discussed the COVID-19 impact on the industry and recovery plans. Sales in grocery retail channels were up substantially given the shift to home cooked meals. There

are signs that maple sales are up and may be sustained post-pandemic. The observation is that the sales increase is not solely due to the initial pantry loading and retailer forward buying. Increased household consumption due to more in-home cooking may have caused a more favorable and sustainable change in maple syrup consumer habits.

For many small and medium producers that rely on selling directly to consumers, the pandemic is causing lost sales and operating difficulties. Opportunities to sell via local fairs and farm stands have decreased.

Additionally, a lot of food is now bought online, maple syrup included. To compensate for this shift, some producers have upped their game online to great success by advertising their products online, taking orders and payments online, and using mail delivery and packaging orders for farm stand pickup.

IMSI members agreed that the pandemic has changed the sales channel dynamic and consumer habits considerably. When vaccines and better treatments for COVID-19 are available and new social distancing habits are formed, it is likely that some traditional selling activity will come back. However, it is advisable to adapt by building online sales and marketing capacity and aggressively pursuing more effective sales channel strategies and marketing tactics to mitigate for the shift to online buying.

Some States Collaborating on Fall Maple Tour

With the COVID-19 crisis resulting in the cancellation of many maple producing states' events in March and April, several states have joined together to organize "Fall in LOVE with Maple: North American Maple Tour."

The event will be held October 9-19, and will feature sugarhouse open houses and tours in at least five states. As of this writing, Pennsylvania, Ohio, Maine, Vermont, and New York are participating. Other state associations have participated in the planning, but are unable to hold events due to assemblage restrictions and public health concerns in areas where the virus outbreak is still widespread.

The event website is at <https://fallmapletour.com/>. Organizers intend for this to become an annual event. For more information contact Helen Thomas at NYSMPA: hthomas@nysmaple.com.

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Russell Davenport

Massachusetts sugarmaker Russell Maurice Davenport died April 7, 2020.

Russ was a farmer, maple producer, tinkerer, and strong until the very end. During his 90 years, he traveled every inch of Mt. Massamet and loved farming and agriculture.

Born in 1929, Russ learned at a young age how to make do with little and use Yankee ingenuity to make things go. Over the years he watched horses make way for tractors, mowing machines replace scythes, and square hay bales succeeded by round. In the 1960s he tried to harness the wind by building a windmill to power the farmhouse.

Throughout his life, there was always maple syrup. Russ said he had sap running in his veins and would put syrup on everything - hot biscuits being a favorite. From the first slightly warmer days in February until the tree buds marked the end of the season, he tapped, gathered, boiled, and canned through three sugarhouses, first with wood slats as fuel, then oil, and then the state's first reverse osmosis machine. The current Davenport Maple Farm Restaurant was a dream realized in 1990, with sap pumped directly to the tanks - no more slogging on snowshoes over knee-high snow and muddy roads. For ten years, he and Martha greeted visitors to the maple booth in the Massachusetts building at the Eastern States Exposition, where Russ al-

Davenport continued on page 34

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Davenport: continued from page 33

ways had stories to tell to anyone who would listen.

His accolades were many: elected chair of the North American Maple Syrup Council and inducted into the North American Maple Hall of Fame in 1986, named Massachusetts Outstanding Tree Farmer in 1991, appointed to the state Board of Food and Agriculture in 1993 and became chairman in 1999, oversaw the complete rewriting of the North American Maple Syrup Produc-

ers Manual that was published in 1996, was awarded life membership in the Massachusetts Maple Producers' Association in 2001, was named the first of the 150 "Faces of Massachusetts Agriculture" in 2002, and was honored for his outstanding service by the international maple industry in 2004 in Lake Placid. Russ and Martha attended every NAMSC annual meeting for almost 40 years.

Full obituary: <https://legcy.co/326AOix>



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Contact your attorney for information on how to revise your will, or your financial institution, plan administrator, or life insurance agent for the procedures required to revise your beneficiary designations.

The information needed for your legal documents is: North American Maple Syrup Council, PO Box 581, Simsbury, CT 06070.



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