

MAPLE *Mainline*

December 2018

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WELCOME TO THE 2019 VERMONT MAPLE CONFERENCES!

A partnership between University of Vermont Extension and the Vermont Maple Sugar Makers Association

Before the 2018 season, many considered the greatest threat to good production was the risk of sudden warm weather like was seen in 2012. As it turned out, weather that was too cold for sap flow was the story of the season. Reports from operations in historically cold pockets or higher elevation sugarbushes were not encouraging. Some producers who had more moderate temperatures reported average or above average yields. Operations that had trees tapped in both cold and more moderate areas saw the differences firsthand. In the end, the season total production was down slightly but not significantly from 2017, thanks in large part to continued increase in the number of taps.

The 2019 Vermont Maple Conferences will be held on January 19 at the School for International Training in Brattleboro and on January 26 at Lamoille Union Middle and High School. The program includes the following five subject tracks: Maple Production and Innovation (MAP), Maple Business Management (BUS), Regulations and Maple (REG), Sugar Bush Health (SUG), and Marketing and Media (MAR). Within those subject tracks there are more than twenty possible classes to choose from. There will be speakers who are well known to maple producers as well as new voices who bring new perspectives and ideas to the maple industry.

The issue of FDA (Food and Drug Administration) registration and compliance with the Food Safety Modernization Act (FSMA) has been on the minds of sugarmakers for quite some time. Commander Joseph T. Frost, Food Specialist with FDA and U.S. Public Health Service, will present on FSMA and maple production, and help explain the implications of this federal regulation. Speakers will also cover how to write a business plan, how to determine the nutrition status of your sugarbush soils as well as a look at how the expanding markets for maple fit in the global economy.

Online registration is available through the Vermont Maple Sugar Makers Association website www.vermontmaple.org/maple-conferences or by filling out the paper registration form included in this issue of the *Maple Mainline*.

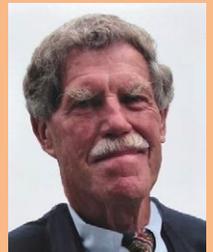
Hoping to see you all at the conferences.

-Mark Isselhardt, UVM Extension Maple Specialist

SYRUP FLAVOR CAN ONLY BE JUDGED BY TASTING. MAKE SURE TO SAMPLE EVERY BATCH.



This issue of Maple Mainline is dedicated to a longtime maple supporter, Don Lockhart. Don focused his substantial creative talents to promoting the Vermont maple industry. He served on the Vermont Maple History Committee, the Maple Promotion Board, and the Maple Foundation; worked with the annual Vermont Maple Festival; and authored numerous maple-related videos, books and pamphlets. In recognition of this work, Don and his wife Betty Ann were inducted in 2014 into the American Maple Museum Hall of Fame in Croghan, New York.



Don Lockhart, 1925-2018

2019 MAPLE CONFERENCES

SATURDAY, JANUARY 19

School of International Training (SIT)
Graduate Institute
1 Kipling Road | Brattleboro, Vt.

SATURDAY, JANUARY 26

Lamoille Union Middle School (LUMS)
East Entrance
736 Vt. Route 15 West | Hyde Park, Vt.

Registration Opens: 7:30 a.m.
Welcome & short presentations: 8:15 a.m.
Sessions: 9:45 a.m. - 3:45 p.m.
\$10 VMSMA Members / \$40 Non-Members
\$5 Students / \$15 for Lunch

Sponsored by UVM Extension
& Vermont Maple Sugar Makers Association

REGISTRATION:

www.VermontMaple.org/maple-conferences

To request a disability-related accommodation to participate in this program, please contact Amanda Voyer at 802-858-9444 by January 2, 2019 so we may assist you.

Directions to School of International Training

World Learning Center, 1 Kipling Road, Brattleboro, Vt.
From North or South: Take I-91 to Exit 3 (Brattleboro) to Route 5 South. Go south on Route 5 to Black Mountain Road on right. Take Black Mountain Road 0.6 miles; keep right at Y onto Kipling Road to World Learning Center at 1 Kipling Road. Follow "Maple Conference" signs.
From East or West: Follow usual routes to Brattleboro to Route 5. Then follow directions above. Note: Exit 3 is on north end of town.

Directions to Lamoille Union Middle School

763 Vt. Route 15 West | Hyde Park, Vt.
Follow Vt. Route 15, east or west, to Hyde Park. LUMS is #763, on the north side of Route 15.

SUBJECT TRACKS:

- Maple Business Management (BUS) 
- Maple Production and Innovation (MAP) 
- Marketing and Media (MAR) 
- Regulations and Maple (REG) 
- Sugarbush Health (SUG) 

The day is divided into four sessions, plus lunch:

- Session 1: 9:45 - 10:45 a.m.
- Session 2: 11:00 a.m. - 12:00 p.m.
- Session 3: 1:30 - 2:30 p.m.
- Session 4: 2:45 - 3:45 p.m.

There will be five or six classes during each session. Each class is one hour long. Attendees do not need to register for specific classes.



Unless otherwise noted, photos throughout are by Mark Isselhardt.

REGISTER ONLINE

Save stamps & staff time!
www.VermontMaple.org/maple-conferences

OR BY MAIL

Make checks payable to VMSMA & mail to
189 Vermont Route 15 | Jericho, VT 05465

Which conference are you registering for?

- January 19 at SIT in Brattleboro, Vt.
- January 26 at LUMS in Hyde Park, Vt.

Name _____

Address _____

Phone _____

Email _____

Attendee Name(s) _____

VMSMA Members _____ x \$10 = _____

Non-Members _____ x \$40 = _____

Youth _____ x \$5 = _____

Meals _____ x \$15 = _____

Total \$: _____



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FSMA and Maple Production (REG)

Joe Frost, MPH Commander, U.S. Public Health Service Investigator, Food Specialist

From the Bioterrorism Act of 2003 to Food Safety Modernization Act (FSMA) of 2011 there has been confusion among maple producers about registration and inspection of sugarhouses. This presentation will explain FDA requirements and help answer sugarmaker questions.



Strategies to Mitigate Climate Change Impacts on Sap Yields (SUG)

Abby van den Berg, Research Assistant Professor, University of Vermont Proctor Maple Research Center

Among the strategies thought to potentially mitigate impacts of yield losses (which can occur as a result of the more unpredictable weather conditions and events caused by the changing climate) include tapping in the fall or early winter, and/or subsequent “freshening” of the tap holes by re-drilling them wider and/or deeper. Preliminary results of an experiment conducted to determine the net yields and revenues of several of these strategies will be presented.



One-Hour Maple Business Plan (BUS)

Mark Canella, Farm Business Specialist, UVM Extension

Business planning comes in all forms and is an ongoing process. This session is designed to adapt the components of a traditional business plan into fast and easy format so that participants can develop a one-page plan in one hour. Short teaching segments on your business vision, production set-up, investments and marketing will be accompanied by a one-page business planning sheet and time to work on it. Participants will leave the session with a basic plan outline, budget targets and the business goals that are important to their success.



Maple Economics and Industry Trends (BUS)

Mark Canella, Farm Business Specialist, UVM Extension

This presentation and group discussion will focus on maple economics and industry trends that impact your region and your business. Mark Cannella will share trends from Vt. Maple Business Benchmark information, years 2013 to 2017, and how different business profiles relate to financial performance. The presentation will also include a discussion on supply, pricing, policy and new legal resources for maple producers.



Business Planning Tools Clinic (BUS)

Mark Canella, Farm Business Specialist, UVM Extension

Come and test out newly developed maple business planning tools and quick financial calculators for your business. Conference attendees are invited to step into the classroom for 10-minute sessions. This classroom will be set up with laptop computers loaded with online business tools and the instructor will provide demonstrations and coaching. Planning tools include five-year average yield calculator, sales forecast and retail pricing calculator and a business plan module.



Selling Maple Syrup to Schools: Why It Is Important and How to Do It (MAR)

Abbie Nelson, Northeast Organic Farming Association of Vermont (NOFA-VT)

Develop future maple syrup customers through the school food program! If students are served maple syrup regularly in school, use it, and buy it later as adults, it will become the norm for them. In this workshop, participants will demystify the school meal program and learn how to navigate the regulations regarding school procurement bids.



Building a Hobby-Sized RO (MAP)

Jacob Walker, Sugarmaker, 2017 Vermont Maple Ambassador, Vermont Technical College Student

RO (reverse osmosis) technology is being successfully used by producers of all sizes. Some small sugarmakers have designed and built their own ROs. This presentation will cover what is involved in design and sourcing parts for hobby-sized ROs as well as how to run the units.



National Weather Service Weather Forecast and Climate Services (BUS)

Paul Sisson, Science and Operations Officer, National Weather Service, Burlington, Vt.

We will discuss our wide range of text and graphical warning, forecast and climate products and services available to sugarmakers on the National Weather Service website. These products and services are aimed to provide information to users to be weather ready and able to make informed weather and climate related decisions. We will also look back at past maple season's climate records and current forecasts for the upcoming season.



Ag Education in Your Sugarbush (BUS)

George Conklin, Farm-Based Educator, Shelburne Farms

Welcoming students into your sugaring operation teaches them about the importance of the maple industry and Vermont's working agricultural landscape. This workshop will highlight how your maple production intersects with fun and activity-based student learning in math, engineering, community, environmental studies and more! Gather ideas for connecting with schools, tips for safely managing a school group in your sugarbush, and activities that will keep students and teachers engaged while they learn about this important Vermont industry.



Using Low-Cost Diaphragm Pumps to Generate Vacuum on a Maple Sap Line (MAP; Brattleboro only)

Dave Bisbee, Sugarmaker and Owner, Mountain Maple

Small- and medium-size diaphragm pumps have been proven to be an economical solution to generating vacuum in maple sap lines for the small producer. In this session we will discuss different types of diaphragm pumps and their pros/cons, power sources, sap line configurations, things to watch out for, and methods of control.



Reduced Sap Yields From Tapping into Stained Wood (MAP)

Mark Isselhardt, Maple Specialist, UVM Extension

What is the impact on sap production when you tap into an old wound? With tubing systems, it is almost impossible to know for sure. This presentation will cover preliminary sap yield data from clean tap holes versus holes which hit brown wood.



State of the Maple Market – Panel Discussion (BUS)

Moderator Mark Isselhardt, Maple Specialist, UVM Extension, and Reza Ramazani, Ph.D., Professor, Department of Economics, Saint Michael's College. Additional panelists from various industry sectors TBD

Where is the industry headed? Where are bulk prices headed? Is the global market demand for syrup keeping pace with the expansion in production? Bring your questions for this panel of experts.



Should You Lime Your Sugarbush? (SUG)

Carine Anecou, Forestry Engineer, Sugarbush Nutrition Expert and Private Contractor

Signs of decline in sugar maple stands have prompted renewed interest in the practice of applying lime to forest soils. This presentation will cover what the benefits of liming are and when it is appropriate to do so.



Sugaring Over the Decades - A History in Franklin County (SUG)

Nancy Patch, Franklin/Grand Isle County Forester, Vt. Department of Forests, Parks and Recreation

The presentation will describe how sugaring has changed and perhaps how it has stayed the same. Nancy will use Franklin County, which is the largest producer of maple syrup in the state of Vermont, as the lens to view this recent change. There will be additional discussion about sugarbush management options available to maple producers.



Evaporation - What is in the Bottle, and Even the Barrel, Must Be Perfect (MAP; Brattleboro only)

Joël Boutin, Agricultural Technician, CETTA (Quebec Maple Producer Group)

When it comes time to pack the syrup we must take precautions to ensure that the product is perfect. Density, filtration and taste ... it's a big goal.



Training Your Website for Google (MAR)

Mike Lannen, Founder + Creative Director, Eternity Marketing

Search Engine Optimization (SEO) is the holy grail to success in the highly competitive online market. Effective SEO is the first step in helping customers find you. This beginner level presentation will review five tools that you won't want your competitors to know about!



High Level of Vacuum; Good, But at What Price? (MAP; Brattleboro only)

Joël Boutin, Agricultural Technician, CETTA (Quebec Maple Producer Group)

We have pressure from our industry to increase the vacuum level. This is not easy, and not desirable in all cases.



Evolutionary Web Design – Never Redesign Your Website Again! (MAR; Hyde Park only)

Mike Lannen, Founder + Creative Director, Eternity Marketing

This intermediate level presentation will explore strategies for never having to fully redesign your website again – really! You'll leave this session with clear action items to incrementally improve your website while engaging your customers and increasing your website's value.



Keys to High Yield Sap Production (MAP; Hyde Park only)

Tim Perkins, Research Professor and Director, University of Vermont Proctor Maple Research Center

This presentation will summarize the results of recent research covering the keys to high yield sap production. Producers will leave with a short list of essential tasks to achieve and maintain a profitable operation.



Spout and Tubing Sanitation for 5/16" and 3/16" Tubing Systems (MAP; Hyde Park only)

Tim Perkins, Research Professor and Director, University of Vermont Proctor Maple Research Center

Do sanitation and replacement practices commonly used in 5/16" tubing need to be adjusted for 3/16" systems? This presentation will cover recent research and make recommendations about how to keep tubing systems productive.



How Did the Sap Get Across the Road? (MAP; Brattleboro only)

JR Sloan, Owner, Green Mountain Mainlines, Fletcher, Vt.

"Welding" and "burying" are words not normally associated with maple. JR will be discussing some of his advanced and innovative techniques for pipeline installation and moving sap in difficult situations.



What Do Tubing a Woods and Framing a House Have in Common? (MAP; Brattleboro only)

JR Sloan, Owner, Green Mountain Mainlines, Fletcher, Vt.

How do you plan, install and maintain a modern tubing system? JR will cover the concepts needed to maximize production, regardless of the scale of your operation.



Hiring and Keeping a Great Crew (BUS)

Glen Goodrich, Co-Owner, Goodrich's Maple Farms, Cabot, Vt.

A productive and efficient maple operation relies on having a good woods and sugarhouse crew. Glen will discuss strategies for hiring, training and retaining good help, and keeping an operation productive.



A Macro View of Maple in the Global Economy (BUS)

Reza Ramazani, Ph.D., Professor, Department of Economics, Saint Michael's College

The maple industry has grown dramatically in the last 25 years. Maple is being marketed globally and to consumers who might be trying it for the first time. This is all with a backdrop of a shifting international trade landscape. This presentation will address how maple fits into the global economy and where the industry is headed.



Sugarmaking for Beginners and Small-Scale Producers (MAP; Hyde Park only)

George Cook, Retired UVM Extension Maple Specialist and Experienced Small-Scale Producer

Everything from identifying and tapping crop trees through boiling and packaging your syrup. George will include his experiences of using an RO for the first time during the 2018 season.



Marketing Opportunities for Maple (MAR)

Vt. Agency of Agriculture, Food and Markets

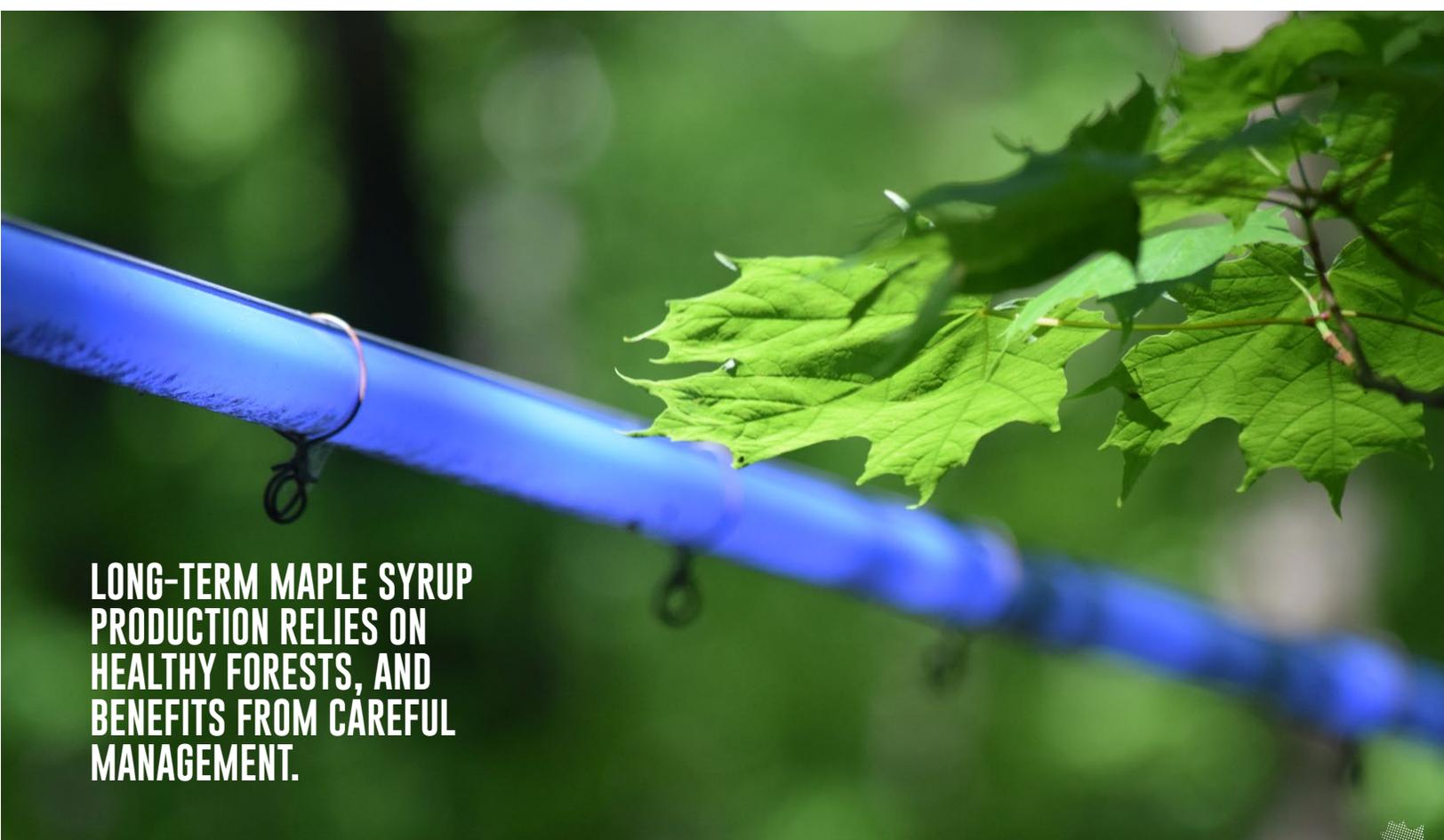
This presentation will describe the recently awarded Acer Access project that focuses on consumer awareness and consumption domestically and abroad. The objectives outlined take a multi-faceted approach to develop knowledge and interest in maple for two primary consumer groups – the conscious consumer and food service professionals directed marketing campaigns, agritourism and international market growth.



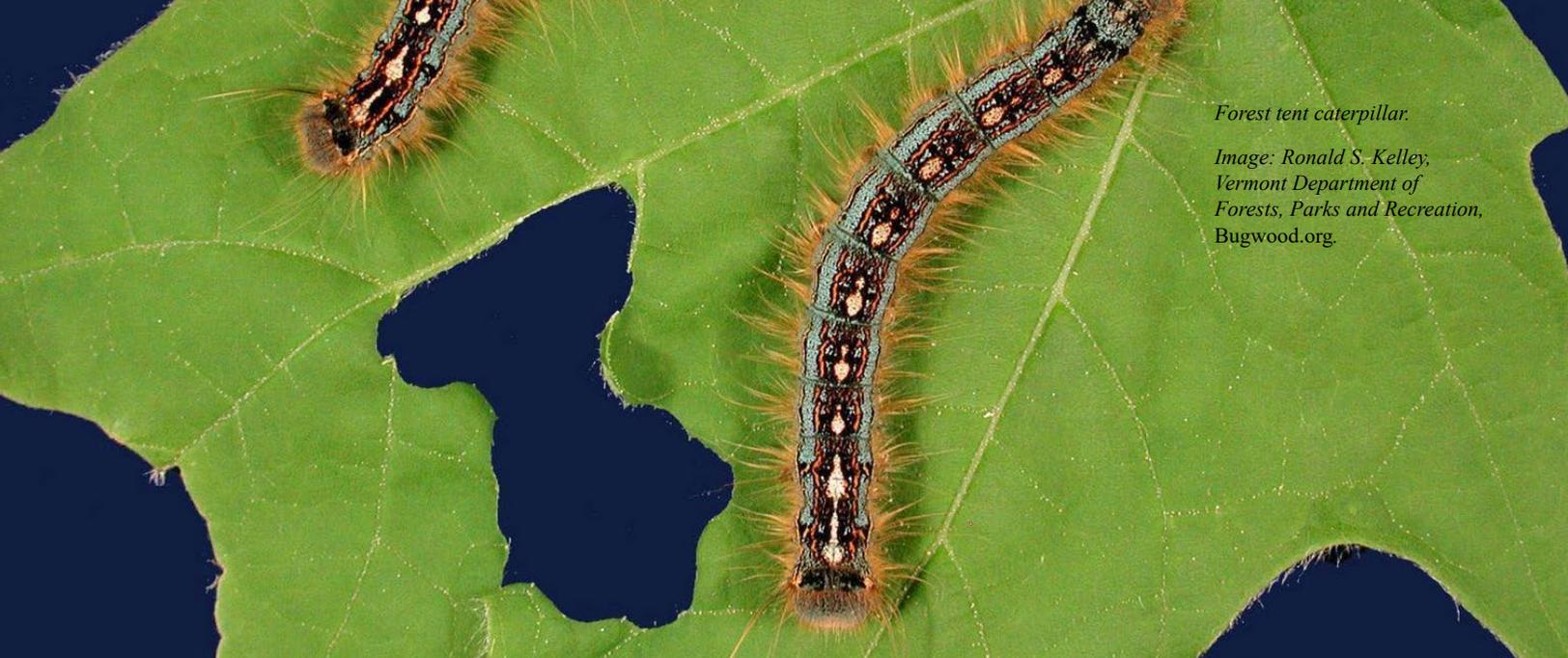
Just for the Record (BUS; Hyde Park only)

Brian Stowe, Research Specialist, University of Vermont Proctor Maple Research Center

Keeping good records has always been a part of maple production. From writing the year's production on the sugarhouse wall to precise measurements of RO performance, detailed records help you analyze your business and production performance.



**LONG-TERM MAPLE SYRUP
PRODUCTION RELIES ON
HEALTHY FORESTS, AND
BENEFITS FROM CAREFUL
MANAGEMENT.**



Forest tent caterpillar.
 Image: Ronald S. Kelley,
 Vermont Department of
 Forests, Parks and Recreation,
 Bugwood.org.

FOREST TENT CATERPILLAR By Vermont Department of Forests, Parks, and Recreation

Forest tent caterpillar (FTC) populations increased again in 2018, with 71,315 acres of defoliation mapped during statewide aerial surveys compared to 60,584 acres mapped in 2017. This accounts for roughly 2% of the northern hardwood forest in Vermont. The area defoliated decreased in southern and central Vermont, but more than tripled in Essex County. Defoliation data are available on the ANR Natural Resources Atlas.

At four sites in northern Vermont monitored for spring FTC activity, hatching was first observed in mid-May, roughly 2 weeks later than in 2017. Caterpillar development progressed rapidly, and by the last week of May defoliation had begun.

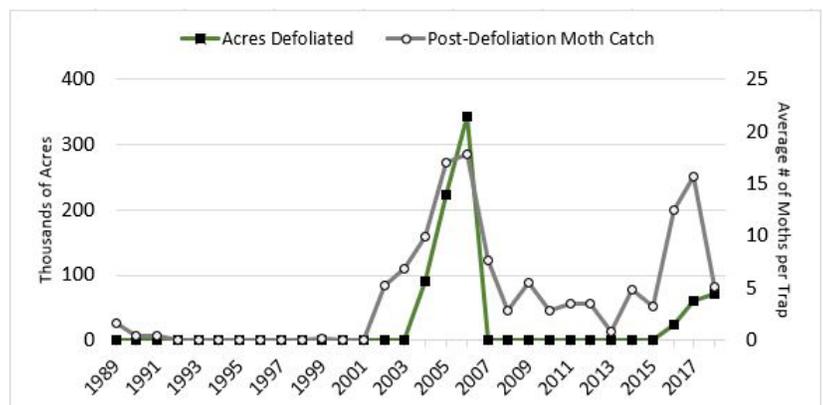
In late 2017 and early 2018, FPR staff assisted landowners with FTC egg mass surveys to determine the likelihood of defoliation on their property. Of the 84 sugarbushes surveyed, 30 locations were identified as at risk of defoliation. Landowners made arrangements with an aerial applicator to have thirteen properties treated with Foray48, a Btk (*Bacillus thuringiensis* var. *kurstaki*) product that is registered for use in certified organic production. In total, these accounted for 4,129 acres. Several additional forest landowners also had their forestland treated. A sample of treated and untreated sites was evaluated once FTC feeding was complete. Among sites predicted to be defoliated based on egg mass surveys, untreated stands averaged 25% foliage loss compared to 15% for treated stands. Stands not predicted to be defoliated experienced only 5% foliage loss on average.

FTC parasitoids known as friendly flies were reported throughout the defoliated areas, and there was some early caterpillar mortality likely due to viral and/or fungal infection. Pheromone traps for FTC were again deployed throughout the state in 2018, and moth cap-

ture decreased dramatically from 2017 levels. If results from the previous outbreak (2004-2007) are any indication, we may see a reduction in defoliation in 2019. While this is a hopeful sign, we will have a better prediction for defoliation in 2019 after winter egg mass surveys have been completed.

This year was also the first year in the current outbreak where tree mortality associated with FTC was visible. Most trees recover from FTC damage, but defoliation can incite tree decline if other stresses are present. In 2018, 4,550 acres of sugar maple dieback and mortality were mapped in locations which had been recently defoliated by forest tent caterpillar in previous years.

The presence of tree mortality following defoliation is likely related to refoliation failures that occurred in all years of the current outbreak (2016-2018). There were abnormally dry and drought conditions in all three years. Other contributing factors may have been the heavy seed on sugar maple in 2017, a late start of feeding in 2018 due to wet weather, and infection by leaf fungi.



(above) FTC moth capture decreased dramatically from 2017. In the previous outbreak, this signaled a collapse of the population, with no defoliation mapped the following year.

2018 WEATHER INFLUENCES ON FOREST HEALTH

By Vermont Department of Forests, Parks, and Recreation

Temperatures for meteorological winter, December 2017 to February 2018, averaged near normal despite some wild swings. Snowpack dropped off in February, then was above normal by mid-March, when over 50 inches of snow had fallen in parts of the state. March and April averaged below normal temperatures and with limited sunshine, winter-like weather continued through the end of April. Green-up was generally delayed. Ash, oak and red maple leaves were still not fully expanded at higher elevations by the end of May.

Below normal precipitation continued from May through early July statewide. The end of June marked the beginning of a heat wave, with temperatures remaining above average through the rest of the growing season. The U.S. Drought Monitor listed most of Vermont as abnormally dry starting on June 19. Moderate drought started in the southern counties on June 26 and shifted through the month of July as rainfall patterns started to diverge between northern and southern parts of the state. By early September, parts of northern Vermont were in severe drought, which persisted through the end of October near the Canadian border. During July aerial surveys, 2,107 acres of drought damage were mapped. Since this was well before the peak of drought conditions, the actual acres of damage to hardwood foliage was significantly larger.

Early fall color started in August but, with the warm temperatures, was slow to progress. Widespread color change arrived about two weeks late. Brilliant early and mid-season color gave way to a muted late-season due to a cloudy October. With the late start, limited frost and lack of stormy weather, leaves persisted on oaks, beech and other late-turning species well into November.

Severe tree-damaging storms punctuated the growing season. A partial list includes strong winds and hail on May 4, the remnants of Hurricane Bud including microburst storms on June 18, severe storms in southern Vermont on July 27 and 28, and on August 29 and September 4 in the Northeast. In late November, Winter Storm Bruce dumped wet snow statewide, leaving over a foot at higher elevations. Tree breakage was widespread, resulting in approximately 90,000 power outages.

We continue to monitor phenology for the timing of budbreak, leaf-out, and fall leaf color and drop. Sugar maple budbreak on May 7 was 4 days later than the long-term average, but the timing of full leaf-out was nearly indistinguishable from the long-term average. In fall, the timing of peak color for most species was similar to the long-term average in 2018. Although color development was initially slow, full leaf drop was just one day later than in 2017. Growing season length was 5 days longer than the long-term average.

While seed crops on most species were minimal, especially compared to the heavy seed year in 2017, ash seed production remained heavy. Squirrel populations, which erupted following the abundance of 2017, had a greatly reduced food supply in 2018, and increased squirrel damage to tree buds and bark is expected.

Following the drought of 2016, the late-season dry conditions in 2017, and the prolonged period of warm, dry weather in 2018, water availability continued to be a major driver of tree health and will interfere with tree recovery from defoliation and other stressors.



Timing of bud break and leaf emergence are highly influenced by temperature and day length. While 2018's cold delayed this annual event, the long term trend suggests earlier springs going forward.

MAPLE LEAF CUTTER

Maple leaf cutter (MLC) damage to lower foliage was noticeable statewide in July, but became unusually heavy by early September, when browning and defoliation of entire stands was obvious in many locations. Starting life as a leafminer, then becoming a casebearer in later instars, the MLC completes its life cycle in its moveable dwelling, eventually crawling or fluttering to the ground where it overwinters in a cocoon within the leaf discs.

MLC defoliation was evaluated in late September in 36 maple monitoring plot locations. Heavy defoliation was only reported from plots in southeastern and northeastern Vermont, but moderate defoliation was observed throughout the state. Due to the late timing of defoliation, significant impacts to tree health are not expected.



(right, above) A maple leaf cutter (Paraclemensia acerifoliella) larva removed from the protection of its moveable dwelling. (right) There were increased signs in 2018 of this native, late-season defoliator.



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MAPLE *Mainline*

FROM

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