

# THE PIPELINE

## The Arnot Forest Sugaring Operation

### HIGHLIGHTS

New Generation  
Maple producers.....8

Great New York State  
Fair in Review..... 12

Tap Hole Sanitation  
Research..... 14

Upcoming Schools  
and Conferences... 16

**M**aple producers all over NYS – and beyond – have learned much from the research conducted by the Cornell Cooperative Extension Maple Team. I recently received an invitation for a tour of their home facility, The Arnot Forest Sugaring Operation. I was excited to see where so much of the research we learn about has been conducted. Come along for the visit!

The ride south from Syracuse was perfect this time of year – along Cayuga Lake with spectacular views on a bright sunny fall day. Going through Ithaca, I caught glimpses of the Cornell University campus. Remembering other visits to the campus, I could picture the ornate stone buildings – many of which are on the National Historic Register of Places; truly beautiful and well-maintained! It is rated one of the 10 most beautiful college campuses in the United States.

Heading 16 miles southwest of Ithaca took me to the 4,200+ acre Arnot forest. Just my luck, there was road construction that day so the flagmen confused me, and I turned in at what I thought was the Arnot driveway – a sign led me to believe I was in the correct place.

*continued on page 3*

ARNOT  
FOREST

HUNTING  
PERMIT  
REQUIRED

**FOREST TENT  
CATERPILLAR  
UPDATE**

PAGE 10



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## A Message from our President



TONY VAN GLAD

Happy Autumn!

In the Catskills, the Fall colors weren't as bright as other years. The rainy, cool summer added to a spotty fungus on the leaves and they dropped without much brilliant color. Speaking of leaves, our producers in Clinton, Franklin, and St. Lawrence counties had a severe Forest Tent Caterpillar outbreak. If you are a producer in these areas, check for egg masses on the tree tops in your sugar bush. Doug Thompson gave the Board of Directors very good information on this problem, as he lived through this problem several years ago. We expect to have a seminar at the VVS Maple Conference in January.

Mike Bennett and Gordie Putnam were charged with coming up with drum head labels. They will have the new logo and information blanks for producers to fill out. The idea is to identify both our NY brand and the individual producer. They did a great job. Personalized labels will be available in another month to anyone wishing to order them.

In closing, I would like to thank Helen Thomas, Dave Schiek, Kim Enders, Garry Wohlschlegel and all who helped at the NYS Fair Booth (Maple Center) this year. As you might have heard, it was a record sales year. Great weather helped! I hope to see you at VVS conference!

Tony Van Glad, President NYSMPA

### HELP US KEEP YOU INFORMED!

We send frequent emails to the entire membership to let you know of things happening in the maple world. The latest emails were about state fair consignments and competition entries.

### IF YOU DID NOT GET THEM, do the following:

Send an email to office@nysmaple.com. This will tell us your current email address.. It's possible that our records may need to be updated! Check your spam for office@nysmaple.com and info@nysmaple.com We use these two email addresses to send you the latest news. If your spam filter has them blocked, you will not receive our communications.

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## The Arnot Forest Sugaring Operation continued

*continued from page 1*

However, after driving past several ramshackle, obviously empty buildings, I realized I was at the “lodge and cabins” we have all heard about, and the sugar operation must be in a different area. That was a relief as this area had obviously seen better days!



Back to the road construction, a little further along the road brought me to a second driveway. A rustic sign assured me it was the Arnot Forest. A short drive up the dirt driveway beside a creek felt right this time – I started looking for tubing and sap tanks.

Still close to that creek, I arrived at what appeared promising: two rustic buildings. The larger building was obviously an unsecured equipment storage area. There was tubing running to the back of the small one, and yes, tanks. Maybe this was the sap house and the main operation with evaporator was further up the road? (OK, I ignored the obvious clue of the stacks – it just looked so small!)



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## The Arnot Forest Sugaring Operation continued

*continued from page 3*

Following the sound of Steve Child's voice, I entered through an overhead garage door and found myself in a low ceilinged room that serves as their finishing and bottling room - as well as inventory storage.

Steve introduced his colleague, Aaron Wightman. Aaron is the Cornell Maple Program Support Specialist. Together, with the help of a part-time technician, they run the sugaring operation and do all of the research you benefit from in your sugaring operation.

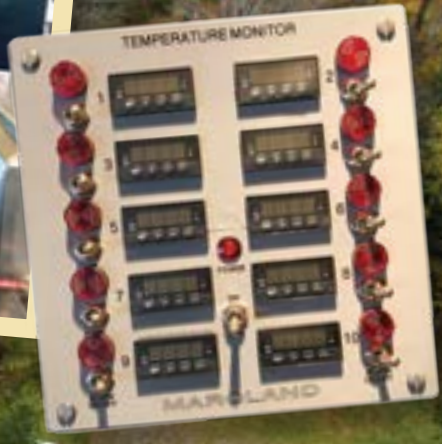
I learned that the crop from the 6,000 taps they now have at the Arnot is sold in various stores in and around the campus, and they are responsible for doing the retail packaging. There is no kitchen, so they have no capacity to make value-added products here. That also means they have no facility to research value-added products on the campus - right now they travel to cooperating maple producers for space to experiment.

A step up took us to the evaporator. (Must be quite a feat getting full barrels down that step!) The room was quite cozy - not much room to get around the equipment. The building was built in the early 60s when there were only 1,000 taps and nothing like reverse osmosis. It was immediately obvious to me that the entire building is uninsulated and unheated. It reminded me of my grandfather's sugarhouse when I was very young.

There were many components of ongoing research to see during the tour. A 10-point temperature monitor system on the evaporator caught my eye - it is enabling research on ways to reduce the formation of ropy syrup. Being versatile, Steve also utilized it when sterilizing sap for his research on ways to make and use fermented maple sap (Is there a maple vinegar coming?)

Turning to the right took us past the inside sap tanks. Steve gave a short explanation of the research they are doing on adding oxygen back to sap to see the effect on flavor - to answer the question of whether closed tubing and reverse osmosis have removed so much oxygen that syrup flavor has been affected.







## The Arnot Forest Sugaring Operation continued

*continued from page 5*

By the way, I also learned there is no running water in the building – the only water source besides permeate is the outdoor hose that runs from the building where Steve and Aaron have their office over 100 yards away. (When it is freezing, the water doesn't run very well!)

We walked through the tiny room that is being enlarged to accommodate an RO large enough to handle their volume of sap. We then went down the back stairs, which is not handicap accessible, to the outdoor tanks.

Steve and Aaron added 2,200 taps and 4,000 feet of dryline in the fall of 2016. The tour went along the mainline, past several ornamental tubing junctions. Steve claimed they were part of his experiments on washing tubing, but maybe his abstract artist side is taking over?


This took us to the 30-acre timber harvest site where Peter Smallidge has an experimental deer fencing under construction. More about that in the next PIPELINE.

We ended the visit "back at the office" – where most of the space is an unheated metal pole garage area. It's the only building with running water and restroom facilities. Used as the maintenance building when the lodge and cabins were operating, the garage area can now be used for storing tubing and other equipment. There is a small room on one side that the maple team uses for office and conference room space.

We spent some time discussing all of the ongoing research projects that the team has in progress. We also discussed priorities for future research projects. I am humbled and awed by the amount of quality research they have been able to accomplish in the existing facility.

I am optimistic that by working together, we can upgrade their facility to not only be state-of-the-art, but also to be the correct size to accommodate the number of taps.



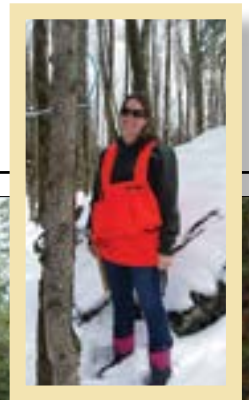
An aerial photograph of a research facility. In the center is a large, dark-colored building with a complex roofline featuring several gables and a central chimney. To its right is a long, low building with a weathered, corrugated metal roof. In front of the main building is a paved area with red chalk markings. To the left of the main building is a smaller structure with a white cylindrical tank on its roof. A gravel path leads from the top of the frame towards the buildings. The surrounding area is covered in grass and trees with autumn foliage.

**"By the way, we also learned there is no running water in the building – the only water source besides permeate is a 300-foot outdoor hose run from the maintenance building."—Helen Thomas, executive director, NYSMPA**

**"I am humbled and awed by the amount of quality research they have been able to accomplish in the existing facility. I am optimistic that by working together, we can upgrade their facility to not only be state-of-the-art, but also to be the correct size to accommodate the number of taps." —Helen Thomas, executive director, NYSMPA**



## The new generation Maple producers: Cedar Brook Farm Maple Confections



**S**cott St. Mary, his wife Katie and two boys, Timmy and Willy, operate a small sugar business in the foothills of the Adirondack mountains near Malone, NY.

In addition to his full-time job with NYS Corrections, Scott contributes his time to the Maple Producers Association. He serves as vice-president of his regional association in Northeast New York, as well as a delegate to the state association. He serves on the executive committee of the state association, a valuable contribution that helps determine policy for the future.

Scott is a very creative cook. He and Katie use maple in their own cooking as much as possible. They also pride themselves in trying to create new maple products. Some of the products they make include apple pie-flavored syrup and maple mini donuts. The maple mini donuts were a huge hit at the Franklin County Fair this year. He is always looking for new ways to introduce maple products to the public, and has shared those ideas and enthusiasm at workshops at the Verona winter conference.

Scott says, "We have been involved with the maple industry for the past 10 years or so. We are very humbled by the support that there is for new producers. There are always new products to be shared and new technology to be learned in this industry."

Some personal cooking tips from Scott:

"On the grill is one of my favorite ways to use maple. Almost any meat that goes on the grill you can glaze with maple syrup or change the flavor with our maple-infused syrups, like our aged vanilla bourbon, vanilla cinnamon syrup or our apple pie flavor. We take large, fresh peaches and cut them in half, take the pit out of them and fill that spot with our apple pie syrup. We put them on the top rack on the grill at low heat for 10 minutes or so - makes a great dessert. To make acorn squash in the oven, cut squash in half, remove seeds, fill with any syrup. Set the oven for 350° F. Place the squash in a dish containing 1/2 inch of water, syrup side up. Cook until tender; [about 90 minutes]. Scoop the squash and syrup into a bowl and mash."



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Nathan and his wife, Cristy, have worked to create a recognizable Dutch Hill Maple brand and to become a well-known "face" within the community and surrounding areas. They have big goals of creating an agritourism destination where guests can visit to learn more about the art of sugaring and experience what Dutch Hill Maple has to offer.

Their enthusiasm for maple extends into involvement in the state maple association. Nate is an alternate member of the Board of Directors for the Central New York region. Cristy is learning the ropes behind the scenes as she provides part time work for Helen at the state association office. They both work very hard at the NYS Fair Maple Center, providing help most evenings through closing time.



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# Updates on the Forest Tent Caterpillar Outbreak 2017

By Helen Thomas

With additional credit to: Peter Smallidge, Senior Extension Forester, Cornell University

Jerry Carlson, Chief Research Scientist, DEC Ecosystem Health and Joe Orefice, Director of the Uihlein Forest

**J**erry Carlson of the NYS DEC tells us they have identified severe defoliation in about 60,000 acres of forest in Northern NY. While they have not confirmed that all of the damage is from the Forest Tent Caterpillar, that is the main culprit identified for everything surveyed so far. There was a severe outbreak last year in Vermont, which has to some extent lasted this year, and some forest owners in Maine and Ontario are also reporting defoliation this year. History tells us this can be a multi-year event.

## Learn all you can about this insect

There is a wealth of information about the insect at the NYS DEC. Use the website link:

<http://www.dec.ny.gov/animals/7111.html>.

The column "important links" on the right side of the screen is especially useful.

## Report your outbreak

If you had an outbreak, contact Helen at the NYSMPA office (315 877-5795) by

November 15. She will compile a list for

Jerry Carlson, Chief Research Scientist,

DEC Ecosystem Health. If possible,

include the number of acres affected,

an approximate number of taps,

and the severity of the outbreak.

## Attend a workshop on how to monitor egg masses and determine if you need to treat next spring

The Cornell Cooperative Extension maple specialists and foresters have prepared workshops to be given at various maple schools. There will be workshops at both the VVS Winter Conference on January 6, the Northeast NY School on January 26, and the St. Lawrence County Maple School on January 27.

Other areas wanting a workshop should contact Steve Childs or Joe Orefice at Cornell University to arrange.

## Monitor your woods this winter

Looking for egg masses in the winter is the best way to determine if you will have a forest tent caterpillar outbreak the following spring. This is a critical step in determining if you need to take action. It is not advisable to wait and see if defoliation will occur as it will likely be too late to fight the insects by the time you notice severe defoliation. [It is also not a good idea to preventatively spray insecticide if you don't have forest tent caterpillars at outbreak levels as spraying is a significant cost.]

Jerry Carlson says: "The egg mass surveys are best conducted after leaf fall. We also found that waiting for the cold weather to knock down the ground cover and ticks and improve visibility was beneficial to the quality and speed for conducting surveys. The detailed instructions for monitoring, including templates for recoding your data are available at the NYS DEC website: [http://www.dec.ny.gov/docs/lands\\_forests\\_pdf/ftcprot2005.pdf](http://www.dec.ny.gov/docs/lands_forests_pdf/ftcprot2005.pdf). If you are unable to download these, contact Helen at the office for a hard copy to be mailed to you." Here are some tips from the DEC concerning the equipment that makes the sampling the easiest and most accurate:

*The spotting scopes should be at least 80mm lens and 100mm is significantly better but more expensive. The scope needs to have a 45 degree angled eyepiece with at least 20X magnification. A zoom eyepiece with 15-80 or 20-100 is best but again angled so you can point the scope upward and not break your neck to look through the eyepiece.*

*The prices vary on these objectives and our Nikons cost about \$400 in 2005. Ours were Nikon fieldscopes with 100mm lenses and 20 to 80 zoom eyepieces. It looks like the equivalents today are around \$600. The tripod is also important to get quality because you don't want it to be rickety or easily broken in a field survey environment. We use Manfrotto 190X pro aluminum tripods with a center column elevation adjustment. These are very easy to use,*

"The egg mass surveys are best conducted after leaf fall. We also found that waiting for the cold weather to knock down the ground cover and ticks and improve visibility was beneficial to the quality and speed for conducting surveys."—Jerry Carlson, Chief Research Scientist, DEC Ecosystem Health



Defoliated Northern NY sugarbush in July 2017

*rugged, and set up quickly on uneven terrain. It also must have the Pan-head attachment with locking wand so you can quickly adjust the direction and angle of view without taking your eye from the scope. Also quick locks for the legs are important. All of these attributes affect comfort and accuracy for the surveyor. Staring at tree twigs 150+ feet away for several hours can make even the hardiest complain about poorly designed equipment. That said, we had several surveyors who were comfortable and confident to lie on their backs and search the trees with 80 power binoculars. I must say though that it takes more experience to see the small egg masses without a zoom or 200 power magnification and differentiating between old and new egg masses is more difficult.*

## Determine what action you will need to take to minimize damage in 2018 IF your winter egg mass survey suggests outbreak levels of forest tent caterpillars

Here are the options NYS DEC offers:

1. Do nothing as trees usually survive defoliation (*Dodds and Seybold 2005*).
2. Mechanical options: place barriers on trees, remove egg masses before they hatch, and remove larvae when they are congregated (*Dodds and Seybold 2005*).
3. Formulations based on the bacterium *Bacillus thuringiensis* (B.t.) can be used to protect weakened trees or to cover large areas where populations have remained high for consecutive years (*Dodds and Seybold 2005*). It is not a contact insecticide and needs to be swallowed to be effective. Bt is registered for



Photo courtesy Jill O'Donnell, Michigan State University Extension

use against FTC and is commonly used to suppress small infestations (*Fitzgerald 1995*). Aerial spraying is most effective in the springtime when caterpillars are still small. You can find commercial aerial spray firms here: <http://www.dec.ny.gov/nyspad/wicket/page?1> (Tip: Use category: forest)

## Implications for maple producers

Full defoliation of sugar maples can result in a 50% decrease in the following spring's sap sugar content. Multiple year defoliation (and single year defoliation of low vigor trees) can result in tree mortality of some stems in a sugarbush. Sugarbushes with greater than 25% of species other than sugar maple are less likely to experience severe defoliation. Meaning, if one or more of every four mature trees in your sugarbush is something other than a sugar maple than your woods are at a lower risk to defoliation. Forest tent caterpillar does not affect red maple.

You can apply for crop insurance for losses due to insect defoliation through the USDA. However, this requires a 10-year history of production and reimbursement is typically only given on losses over 50% of your crop. Meaning if you have a 60% loss of your crop in a season, you will only receive an insurance benefit of 10%.

## What the association is doing

We have been in communication with the folks mentioned at the beginning of this article throughout the summer. Through this publication and directly, we are informing the state agencies and legislators of the problem. We do know there are no funds available through current government sources to spray private lands for forest tent caterpillar.



Nikon fieldscope example



## Great New York State Fair in Review!





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### The taste of sweet success

2017 was a record-breaking year for the NYS Maple producers! Thank you to all who helped out at the Maple Experience booth, Photo Booth and Maple Center! Congratulations to all the winners and producers would contributed to the success of this year's NYS Fair.



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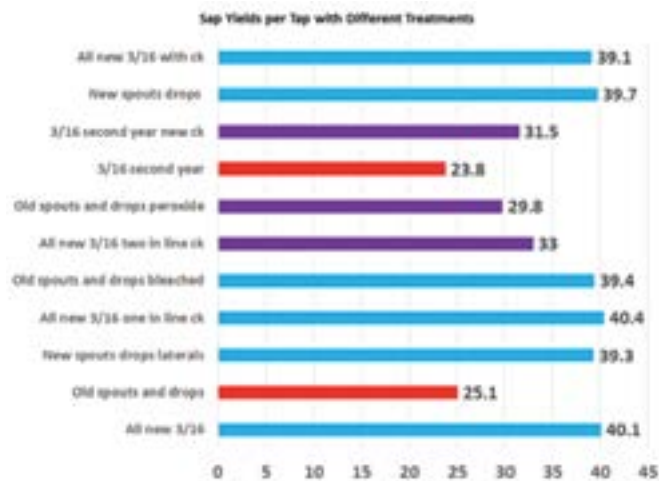
## Tap hole sanitation research in the 2017 season

By Stephen Childs and Aaron Wightman, Cornell Maple Program

In 2017, 11 replicated maple tubing research plots were established at the Arnot Forest. The purpose is to provide information useful in identifying the most effective methods of reducing microbial contamination of the tap hole, resulting in increased sap production. The plots are as follows:

1. All new  $3/16$ "
2. Old spouts and drops
3. All new spouts drops and lateral lines  $5/16$ "
4. All new  $3/16$ " with one inline check valve at the vacuum end
5. Bleach on spout and drop 30 minutes
6. All new  $3/16$ " with check in the middle and vacuum end
7. Peroxide drop and spout
8.  $3/16$ " Second year nothing changed
9.  $3/16$ " Second year with new check valve spout
10.  $3/16$ " All new with check valve spouts
11. Fall tap  $3/16$ " all new

Sap production data is collected daily when sap is running throughout the sap season. All the treatments were on vacuum mainlines that were operated between 22 and 24" of Hg (but when temperatures would fall below freezing, all the lines would drop to 0 vacuum due to freezing sap in the mainlines.)



Test results show several important outcomes. First, is that the poorest yielding system was the second year of using  $3/16$ " tubing. An earlier study showed that when trees drop below freezing temperatures, sap will be pulled back into the tap hole due to vacuum pressures developing in the tree with  $3/16$ " tubing, the sap can be pulled back as much as 12 feet, allowing significant microbe contamination to get into the tap hole and block future yield. It is important to note here that in this set of tests, there was no significant elevation increase from the mainline to the end of the  $3/16$ " lateral. The lines were not developing significant natural vacuum due to sap weight in the lines. Earlier tests with  $3/16$ " lateral lines with 30 to 40 feet of elevation drop developed 15 to 26" of Hg at the spout, which did not show any vacuum reduction during the whole season. This makes it unlikely that sap was being pulled back into the taphole by the natural vacuum in the tree during periods of freezing. Methods of stopping or sanitizing this contaminated sap before it can contaminate the tap hole will be a significant part of future tests with  $3/16$ " tubing where there is no elevation induced natural vacuum advantage. The second poorest yield was with old spouts and drops in  $5/16$ " tubing. This is typically true with new spouts and drops yielding 58% or 14.8 more gallons of sap per tap. Sanitizing spouts and drops with bleach with a contact time of 30 minutes was essentially the same

yield as new spouts and drops. New  $3/16$ " tubing with or without check valves was essentially the same as new  $5/16$ " tubing and spouts with the exception of where a diaphragm style check valve was inserted into the tubing between every other spout in the lateral line. The diaphragm check valves seem to hinder sap flow when there was more than one. Once again sanitizing with peroxide was less successful than treating with bleach.

### Field Observations for $3/16$ " Tubing

The Cornell Maple Program used  $3/16$ " tubing extensively in a 2,200 tap sugarbush expansion at the Arnot Forest in the summer of 2016. It was used most frequently in three applications: 1) long lateral line runs to access trees located far from and uphill from the main line, 2) areas with steep inclines, 3) to access trees located downhill from the

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main line. Basic performance metrics and observations were made to evaluate the functionality of  $\frac{3}{16}$ " tubing both generally and in these specific applications.

The longest lateral lines installed in the Arnot measure approximately 1,200' and are located on a steep (20 to 30%) slope with a northeast aspect. Additional lines of slightly shorter length were installed on the same hillside. During the season, vacuum measurements were taken at the top of each line. Initial measurements indicate a modest gain of several inches of vacuum. These measurements also confirmed that any amount of damage to the line completely eliminated the vacuum and reduced sap production in the line.

Out of necessity, several  $\frac{3}{16}$ " laterals were installed to reach trees located below downhill from the main line. One of these lines sloped gently upward, gaining 20 feet in elevation to access the main. In several other locations, the lateral was spiraled around a tree to reach main lines elevated as high as 14 feet. In both instances, the sap was able to flow upward under vacuum according to observations throughout the season. Vacuum levels at the tap in these instances was reduced from the vacuum in the mainline by about 1" for each foot the sap was lifted. In one example, the vacuum in the mainline was 20" Hg and the sap was being lifted 14 feet in the  $\frac{3}{16}$ " lateral line and vacuum at the tap was 6" of Hg. This area was surrounded by roads so the sap needed to be lifted up and over truck height.

Significant pull back was observed in  $\frac{3}{16}$ " laterals, in particular in those that were pulling sap uphill to the mainline and locations where lines had lost their integrity due to rodent damage, etc. Pull back occurs when trees develop negative pressure during periods of freezing temperatures. When this occurs, sap is pulled through the lateral line back into the tree. In the process, bacteria yeast and molds developing in the lines are pulled into the taphole, thereby increasing the rate of taphole closure. Past studies have found as much as 12 feet of pull back in  $\frac{3}{16}$ " lines on a single tap. In 2017, much greater pull back was observed, including 42 feet of pull back on a long  $\frac{3}{16}$ " lateral with significant slope up to the mainline. This reinforces the need to further test and develop means of maintaining sanitary tapholes in  $\frac{3}{16}$ " lines including check valves, silver spouts and  $\frac{5}{16}$ " drop lines on  $\frac{3}{16}$ " laterals.



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## 2017 - 2018 NYSPMA Upcoming Schools and Workshops

### 2017

**Nov 10-11** Lake Erie Maple Expo,  
Contact: <http://www.pamaple.org/LEME.html>

**Dec 2** Southern Tier Maple Program,  
Contact: Brett Chedzoy,  
CCE Schuyler County, Agriculture and Natural Resources,  
Phone: office: 607-535-7161; cell: 607-742-3657  
[bjc226@cornell.edu](mailto:bjc226@cornell.edu) January 13

**Dec 2** Western NY Maple School, location Attica High School  
Contact: Deb Welch, Cornell Cooperative Extension of  
Wyoming County,  
401 North Main Street, Warsaw NY 14569  
Phone: 585-786-2251; [djw275@cornell.edu](mailto:djw275@cornell.edu)

**Dec 9** Onondaga County Maple School,  
Contact: Kristina Ferrare, Cornell Cooperative Extension  
of Onondaga County,  
The Atrium, 2 Clinton Square, Syracuse, NY 13202,  
Phone: 315-424-9485 ext 231, 315-424-7056 – fax  
[www.ExtendOnondaga.org](http://www.ExtendOnondaga.org)

**Dec 16** Maple Production for the Beginner, Seneca County,  
Contact: Derek Simmonds,  
Agriculture Economic Development Specialist,  
Seneca County Cornell Cooperative Extension,  
308 Main Street Shop Center, Waterloo, NY 13165,  
Phone: 315-539-9251,  
[www.senecacountyccce.org](http://www.senecacountyccce.org)

### 2018

**Jan 5-6** New York State Maple Conference, Verona NY,  
Contact: Keith Schiebel;  
[kschiebel@vsschools.org](mailto:kschiebel@vsschools.org) or go to [cornellmaple.com](http://cornellmaple.com)

**Jan 16** Maple Production for the Beginner, Ontario County,  
Contact: Russell Welser,  
Cornell Cooperative Extension Ontario County,  
480 North Main Street, Canandaigua, NY 14424,  
Phone: 585-394-3977

**Jan 19** Lewis County Maple Production for the Beginner,  
Contact: Michele Ledoux,  
Cornell Cooperative Extension Lewis County,  
5274 Outer Stowe Street, P.O. Box 72, Lowville, New York 13367;  
Phone: 315-376-5270;  
[mel14@cornell.edu](mailto:mel14@cornell.edu)

**Jan 20** Lewis County Maple School,  
Contact: Michele Ledoux,  
Cornell Cooperative Extension Lewis County,  
5274 Outer Stowe Street, P.O. Box 72,  
Lowville, New York 13367;  
Phone: 315-376-5270; [mel14@cornell.edu](mailto:mel14@cornell.edu)

**Jan 26** Maple School at the Miner Institute,  
Contact: Joseph Orefice, Ph.D.,  
The Henry Uihlein II & Mildred A. Uihlein Director of the  
Uihlein Forest, Cornell University Department of  
Natural Resources  
157 Bear Cub Lane, Lake Placid, NY 12946,  
Phone: 518-354-3170

**Jan 27** Maple Expo- St. Lawrence County,  
Contact: Cornell Cooperative Extension,  
1894 State Highway 68, Canton, NY 13617-1477;  
Phone: 315-379-9192

**Apr 26** Maple Value Added Products Workshop, Ontario County,  
Contact: Russell Welser, Cornell Cooperative Extension  
Ontario County,  
480 North Main Street, Canandaigua, NY 14424,  
Phone: 585-394-3977

**July 15-17** New York State Maple Tour, Upper Hudson

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