



Inside This Issue

Message from our President..... 1

We are singing “Virginia is for Maple Syrup Lovers ..... 3

Veterans & Heroes to Agriculture Expands Training and Mentorship Opportunities to Maple ..... 6

WVDA on LABEL REVIEWS AND THE WEST VIRGINIA GROWN PROGRAM ..... 7

A New Year’s Greeting from the Future Generations Appalachian Program ..... 8

Future Generations University’s Maple Certificate Course Goes Virtual ..... 10

WVMPSA and the American Tree Farm System ..... 11

Exploring the Economic Potential of Black Walnut ..... 14

Expanding use of specialty crops (Including Maple Syrup) in craft beverage production ..... 15

Current Maple Research Activities at WVU ..... 15

**2018-2019 Officers:**

President: Keith Heasley  
 Vice President: Chad Trent  
 Secretary: Rachel Taylor  
 Treasurer: Adam Taylor

**Message From Our President**



Happy New Year WVMSPA member

Wow, what a year 2020 was. Maple syrup production in WV in the spring was average, to above average, across the state. However, as we all know, somewhere in the middle of the syrup season this past year the COVID-19 pandemic hit the state and country. Unfortunately, the COVID 19 pandemic has taken control of many parts of our lives, including the maple syrup industry in the past year. Now, we are learning to live with the new normal of wearing a mask and minimizing interactions in public, and working and schooling from home. At the start of 2020, West Virginia was controlling the pandemic better than most states, but this past fall and holiday season the virus has “surged”, and even with the introduction of a vaccine in December, as I write this letter, COVID-19 infections and deaths continue to set new records in WV. Hopefully, with more inoculations and renewed caution on our part, we can turn the corner and get this pandemic under control.

The first WVMSPA activity to be affected by the pandemic this past spring was the second Maple Day, which, out of an abundance of caution, was canceled by many WV producers. This was certainly a significant hit to the sales of these producers. As the spring progressed and the pandemic quarantining rules/guidelines became a new part of our lives, the association chose to cancel our annual

## West Virginia Maple Syrup Producers Newsletter – January 2021

---

spring meeting in May, a social gathering that I sorely miss. This meeting was then replaced in November by a virtual zoom meeting. At the zoom meeting, the 2019-20 officers were asked, and they accepted, to continue in their present positions for 2020-21 year. Also during the meeting, a committee to organize Maple Days was formed and the dates were set to February 20th and March 20th. I believe that through proper planning, WV sugar houses can hold COVID-19 safe open houses. To help with this planning, Cindy Martel will hold a webinar on February 11th, to give best methods for a COVID safe open house. Many other business items for the association were discussed during that meeting from which the full minutes can be found on the association website: [WVMSPA.org](http://WVMSPA.org).

Even with the disruptions and setbacks from the COVID-19 pandemic, the association and our partners were able to continue and progress several projects to help promote maple syrup production in West Virginia. Future Generations University and Experience Learning in conjunction with the WVMSPA developed an Appalachian maple syrup cookbook that not only has some 40 recipes (from many of our members), but also stories of the history of maple syrup in Appalachia. The cookbook is titled: “Appalachian Maple: Recipes and Stories from the Mountains”, and as I write this letter, it is being published. I hope you can add a copy to your maple library.

The three-year project, “Leveraging Education and Research to Promote Maple Syrup Production across Ohio Pennsylvania and West Virginia” led by Ohio State University, and including Penn State University and Future Generations University has been progressing. This project has already sponsored 6 different webinars covering the topics of: “Assessing New Markets...” (6/17/20), “Business and Finance” (6/18/20), “The Coronavirus Food Assistance Program...” (9/1/20), “The Science Behind the Sweetness...” (10/22/20), “Climate Change Impacts...” (11/19/20) and “... Tap Hole Sanitation ...” 12/17/20). You can register for these webinars and find the recordings of the previous webinars at the FGU website, <https://www.future.edu/maple/>. The next webinar is Thursday, January 18th.

Also, a new project: “Accessing South Atlantic Markets for US Maple Syrup: Educating Consumers and Enhancing Distribution Networks” led by Dr. Mike Rechlin at Future Generations University (FGU) is starting. This project is a cooperation between FGU, Virginia Tech, Garrett County Economic Development and Appalachian Sustainable Development, and has the goals of increasing consumer awareness about U.S. maple syrup and expanding into new markets in the South Atlantic region. I see this project as the next logical step in expanding the maple syrup market and promoting maple syrup production in West Virginia. This project has a syrup producer/farmer advisory board and anyone wishing to contribute should contact Mike Rechlin at [mike.rechlin@future.edu](mailto:mike.rechlin@future.edu).

Further, a new manual on “WV Sugar Operation Review Preparedness” has been written by Britney Hervey-Farris and is available on the website. This is an excellent resource for improving the safety of our maple syrup operations and preparing for an inspection by the state. Many kudos to Britney for all of the work. In addition to the manual, there will be a webinar on the manual on January 14th at 7:00 pm. Please register through Future Generations.

2020 was a very trying year, but hope is in sight. The COVID-19 vaccine is being rapidly distributed, and we now know what we need to do to control this disease. I hope everyone and

their families stay happy and healthy this coming year, and may your sap flow long and sweet for the entire maple syrup season.

Please do not hesitate to contact me for any reason.

Sincerely,



Keith A. Heasley  
2019-20+ President, WV Maple Syrup Producers Association  
[keith.heasley@mail.wvu.edu](mailto:keith.heasley@mail.wvu.edu), 304-216-9136

## We are singing “Virginia is for Maple Syrup Lovers”!

By Tom Hammett ([himal@vt.edu](mailto:himal@vt.edu))

College of Natural Resources and Environment, Virginia Tech

January 2021



The new Virginia Maple Syrup Trail begins in Highland County (right across the border!) and features a passport for visitors to document their visit to sugar camps.

It has been a full year! In spite of the COVID 19 pandemic we made great progress in 2020. Many might not know that Virginia produces maple syrup! With our partners we have adopted the phrase “Virginia is for Maple Syrup Lovers”! With it we are raising awareness of our strong maple syrup heritage and our potential to supply maple syrup and other products. There is a lot to report. We have included only a few tidbits here.

We have a group of Virginia Tech students working on a phone App that will help landowners in making decisions on how to assess the sugar maple or black walnut to incorporate tapping in their management plan. While it is still in early development, the hope is that the App will help landowners with these two species to get the assistance that they need when considering biophysical attributes of their landscape.

This year the Virginia tree syrup program expanded our “Maple in the Schools” component, continuing our work in schools in Highland,



Students at Glenvar High School in Roanoke County are enthusiastic about tapping maple trees and making syrup!

Roanoke, and Augusta Counties. This year we added Pulaski County High School where students tapped just 15 trees and gathered over 150 gallons of sap! Boiling was going full speed just as the school was closed due to the pandemic in early March. Pulaski will be a “rising star” – with improvements planned that include adding lines and more taps, and building a rocket stove. Maybe building a sugar shack is next? Stay tuned as this program may become a model for others in the region! The school is not too far from the state line!

For the third year we will be working with Glenvar High School in Roanoke County. In 2020, they produced, designed labels, bottled and sold their syrup for \$10 a 6 oz. bottle! They sold out in a few days! It is an off-season activity that leads into their honey production!

In 2020 we started a program for a local youth environmental group “Seek Education Explore DiScover” (SEEDS) in Blacksburg. We tapped on the first weekend, collected sap for two weeks, and, on the third weekend, we had a family sap boil! With over 100 gallons of sap collected, there was leftover sap to take home to boil there. A few of the SEEDS leaders have been tapping sugar maple trees scattered about on the Virginia Tech campus! Each tree had a small Ball Jar with a homemade bamboo spout! When asked why the Ball Jar and bamboo spout, their response was that the location is a very public location and fancy buckets and spouts “might attract attention and vandalism” (by college students!).

An exciting addition to our program in 2020 was the establishment of The Virginia Maple Syrup Trail. The trail is starting in Highland County. But we plan to expand it throughout the state. With the support of Highland County Chamber of Commerce, we designed, published and distributed passports to all the Highland County sugar camps, and to tourist information centers around the state. When you visit a sugar camp you will get your passport stamped. When you get your passport stamped at



Some enthusiastic Glenvar students wear their equipment while tapping!

## TAP INTO

ALL THAT HIGHLAND HAS TO OFFER

1. **Pufferbarger's Sugar Orchard**  
Is located on Maple Sugar Road in the heart of the Blue Grass Valley. The Pufferbarger family carries on its family heritage by tapping pure Virginia Maple Syrup from the same sugarbush that their grandfathers tapped for many years. They currently use a vacuum gathering system, a reverse osmosis machine and an oil feed evaporator to produce "superior" fine maple syrup.  
www.pufferbargermaplesyrup.com  
111 Maple Sugar Road, Blue Grass  
540-424-5117  
pufferbargermaplesyrup@gmail.com
2. **Laurel Fork Sapsuckers**  
Is a family-run sugar camp that you can join for high elevation views of western Highland County and a taste of the maple syrup making process. They have used mountain-bred trees, as well as equipment from the county's backwoods and over 100 years ago to build their sugar camp and event structure. They will show you the history and progression of the maple syrup industry through four different cooking methods. Spots are a guided hike on their certified Tree Farm after the tour!  
www.laurelforksapsuckers.com  
18077 Mountain Tompkins, Highland  
540-290-1819  
laurelforksapsuckers@yahoo.com
3. **Mill Gap Farms**  
Is the only producer in Virginia who is certified Organic by the USDA. They utilize the latest technology from Vermont and Quebec to produce that maple syrup. In the barn, you can watch them trim and cut the sugarbushes with chainsaws and axes. You can even stay in their cottage to enjoy the peace and beautiful views of Highland County.  
www.millgapfarms.com  
2700 Mill Gap Road, Montevy  
540-683-3332  
kavahill@millgapfarms.com
4. **Duff's Sugar House**  
Is a small family-run, old-time sugar house where the trees are still "opened" by hand and the sugar water collected in buckets. Cooking is done in a wood-fired open pan and finished in an iron kettle. Get an up-close look at how syrup used to be made, and hear how to source a 19th-century farm.  
www.duffsmaplesyrup.com  
3118 Mill Gap Road, Montevy  
540-448-3094  
duff@duffs.com
5. **Back Creek Farms**  
Is a traditional sugar making operation which has taken a modern twist! The Loney family has been making maple syrup since before the Civil War and they still use the open pan passed down from their family's great-grandmother. In addition to pure maple syrup, they also have maple cream (maple butter, maple tye) and work on continually coming up with new infusions to tempt your palate. They produce holiday treats, too.  
www.westmountbackcreek.com  
2788 Upper Back Creek Road, Montevy  
540-499-2302  
info@westmountbackcreek.com
6. **Sugar Tree Country Store**  
Is a one-of-a-kind country store dating back to the early 1800s and is nestled in the small town of McDowell. They utilize various osmotic techniques for making syrup but value the experience of old-fashioned family time to bring you a full range of maple products. Their store contains plenty of other gifts like homemade apple butter, jams and even black syrup, ready to be taken home or shared.  
www.sugartreecountrystore.com  
818 Market House Road, McDowell  
540-796-3444  
sugartree@msnet.net
7. **Bruce's Syrup and Candies**  
Is located on the Loney family farm up on the mountain that overlooks the beautiful Blue Grass Valley, where maple syrup and products have been produced for over 50 years. Advancing beyond just old-fashioned butters and larders in the early days, they now utilize a vacuum system, reverse osmosis, case-of-the-art evaporator, filtration and bottling equipment.  
www.brucesmaplesyrup.com  
824 Fells Drive, Blue Grass  
540-474-5643  
bruce@brucemaples.com
8. **Tonoloway Farm**  
Is Highland County's newest syrup operation and Virginia's only commercial producer of black walnut syrup. Visitors are welcome to taste the unique flavors of walnut syrup, history syrup, as well as classic wood-fired maple syrup. Afterwards, you can hike through the food forest to sugar houses over McDowell and the historic battlefield, visit the walnut & maple groves, and see all the modern tools and vintage tools & more tools.  
www.tonolowayfarm.com  
7902 Highland Terrace, McDowell  
540-376-5123  
tonolowayfarm@out.net

### COLLECT ALL 8 STAMPS AND RECEIVE YOUR FREE PASSPORT GIFT

OFFER GOOD WHILE SUPPLIES LAST

\*Once completed, cut and mail this postcard or bring by the Highland County Visitor Center at 61 Highland Center Drive in Montevy  
[virginiamaplesyrup.com](http://virginiamaplesyrup.com)

NAME: \_\_\_\_\_ PHONE (540) \_\_\_\_\_

ADDRESS OR EMAIL: \_\_\_\_\_

EMAIL: \_\_\_\_\_ PHONE: \_\_\_\_\_

The new Virginia Maple Syrup Trail begins in Highland County (right across the border!) and features a passport for visitors to document their visit to sugar camps.

eight different sugar camps, you are eligible to receive a "I visited them all" tee shirt! You can get more details, and a copy of the passport with a map at our web site: [WWW.virginiamaplesyrup.com](http://WWW.virginiamaplesyrup.com) In spite of the safety and health precautions and arrangements mandated for the pandemic, we continue to mentor new and existing syrup producers. We added new tapping families in areas such as Christiansburg and Ironto and have several inquiries to mentor more landowners in the 2021 season. We also visited existing producers in Wise, Pulaski, and Grayson counties to lend a hand and help several of them plan for expansion.

In spite of the pandemic, we continued our workshop program. The Virginia Maple Academy was held on November 20 and 21 in collaboration with the Wise County Extension Office. We had over 100 participants register and over 70 attended either the Friday evening session for beginners or the Saturday morning sessions for experienced syrup producers.

We have just finished the second year of three years of a Virginia Department of Agriculture and Consumer Services with a USDA Specialty Crop Block Grant "Expanding Livelihood Options for Virginia Land Owners through Tree Syrup". Finding and expanding markets for our producers is very important to our program. So, we are very excited to be partnering with West Virginia and Maryland on a new program funded by the USDA ACER Access Program. The project will focus on matching for Central Appalachia maple syrup with new or expanded markets.

Please send us your ideas, and suggestions. To learn more about the Virginia Tree Syrup Program contact Tom Hammett, at Virginia Tech, email: [himal@vt.edu](mailto:himal@vt.edu) or Missy Moyers-Jarrells, at the Laurel Fork Sapsuckers Sugar Camp, email: [joandmissyjarrells@yahoo.com](mailto:joandmissyjarrells@yahoo.com)

## Veterans & Heroes to Agriculture Expands Training and Mentorship Opportunities to Maple



Established in 2014, the West Virginia Veterans & Warriors to Agriculture Program was dedicated to the integration and support of veterans and their family members entering or currently working in agriculture. Then, in June of 2020, the program made the exciting change to the “Veterans & Heroes to Agriculture Program”, keeping the same core principles but widening the opportunity for membership to firefighters, law enforcement, emergency medical services personnel and other first

responders in their list of eligible participants.

Like many organizations, the program has made several changes in recent months to be able to safely continue offering training and support since the onset of COVID-19. The program’s Veterans Education and Training Series (V.E.T.S.) is one area that has been subject to some of those changes.

What started out as a more traditional, in-person, classroom-based program has evolved to be more flexible while continuing to offer high-quality education and hands-on experience. Back in July, the program staff experimented with this new format during the beekeeping series, in which participants met weekly for online classes and were given the option to participate one-on-one with a mentor. This mentorship included a hands-on activity checklist to help guide the practical experience, followed by a 15-hour internship requirement where the participant assisted with the beekeeper’s normal workload.

The program is excited to be working with maple syrup producers around the state to offer this same experience on maple syrup production. With the first class on January 14, this seven-part online series is taking participants through the process of getting started in the maple syrup industry. As with beekeeping, participants have been paired with local mentors to provide them hands-on experience.

In addition to V.E.T.S., members may now receive scholarships for a number of education and training opportunities. For more information, visit <https://agriculture.wv.gov/ag-business/veterans-and-heroes-to-agriculture/> or contact the program coordinator at [vetstoag@wvda.us](mailto:vetstoag@wvda.us) or (304) 558-2210.



## WVDA on LABEL REVIEWS AND THE WEST VIRGINIA GROWN PROGRAM



The West Virginia Department of Agriculture is the regulatory agency for most sugar houses in the state. For maple producers who have value-added maple products (i.e. candy, cotton candy, cream, marinades, BBQ sauce, etc.), inspection, recordkeeping and labeling requirements will vary and home kitchen inspection, FDA commercial kitchen, WV food processors license and other requirements will vary depending on the food form, stability and where you are selling your product.

It is recommended that you use the West Virginia Farmers'

Vendor Market Guide:

[https://agriculture.wv.gov/wp-content/uploads/2020/09/WVFMG\\_2020\\_F2\\_5.7.20-003.pdf](https://agriculture.wv.gov/wp-content/uploads/2020/09/WVFMG_2020_F2_5.7.20-003.pdf)

for additional decision trees and contact information as you grow your maple product line. Discussing your upcoming plans with your West Virginia Department of Agriculture (WVDA) maple inspector at the time of your facilities review will also lend insight on how to grow your maple business.

WVDA currently offers a product label review service through their Business Development Division. Certain products require a label review, but the service is available to any producer who requests it, even if the product does not require it. Label review is also required of any producer (product) who is requesting to join West Virginia Grown, the premiere agricultural branding program. Your label will also be reviewed during a sugar house inspection for the elements listed in Section 6. For questions on product labels and review, contact [productlabeling@wvda.us](mailto:productlabeling@wvda.us).

West Virginia Grown is the premiere branding program for agricultural products. The Program's mission is to convey to the consumer that when they buy a West Virginia Grown product they are putting dollars right back into the communities we all live in. There is no cost to apply or retain membership in the Program. Some Program benefits include: use of the WV Grown Logo, the option for inclusion in an annual online and printed directory and WVDA social media and Market Bulletin coverage.

Participation guidelines, application and logo authorization information can be found at: <https://agriculture.wv.gov/wp-content/uploads/2020/09/WV-Grown-Packet-F.pdf>

For more information on West Virginia Grown, email [wvgrown@wvda.us](mailto:wvgrown@wvda.us) or call 304-558-2210.

## A New Year's Greeting from the Future Generations Appalachian Program



Steam rising through the Cupola of the Mobile Sugar Shack, rechristened the *West Virginia Sapmobile*, at the inaugural firing of the evaporator.

Maple Friends,

Last year was a very busy one for the Future Generations Appalachian Program. Professor “Maple Mike” Rechlin completed the final components of the long-awaited Rocket Stove Evaporator with the Robert C. Byrd Institute. Designs will be available soon. Kate and Mike also put the finishing touches on the Mobile Sugar Shack, which will be used to support this year’s walnut and birch research before hopefully going on the road this summer with Experience Learning.

Our goal at Future Generations University is to be a resource for all maple syrup producers as we navigate the path forward in this pandemic. We worked closely last year with the West Virginia Maple Syrup Producers Association to ensure that maple syrup producers were eligible for assistance from the USDA during both rounds of the Coronavirus Food Assistance Program. Our goal for the year ahead is continue to make sure that as similar opportunities are made available, producers know how to access assistance, and technical support to help meet any requirements mandated by state or federal regulators.

We are dramatically expanding the branding and marketing resources in the year ahead. It is our current aim to offer a range of workshops as well as identify and connect regional producers to additional marketing opportunities. Marketing needs have changed significantly with the pandemic, and the ability to speak directly to consumers has decreased, making it more important than ever to have branding and marketing strategies that still reach buyers.



West Virginia’s Maple in the Classroom program director Kate Fotos talks syrup making to visitors at the inaugural firing.



Additionally, we will be working to educate the consumers in the greater region about the benefits of maple syrup in comparison to other sweeteners. Maple related agri-tourism has vast growth potential even in the midst of the pandemic as a result of being the southernmost syrup producing states. We are also working to explore options for COVID-safe sampling and packaging options.

The Appalachian Team is available to help support producers interested in diversifying or expanding their current sugaring operation such as value-added. Similarly, there are additional opportunities such as the production of walnut and other tree syrups that can enhance the syrup industry in this region. Our research is teaching us more about these opportunities each season and we want to share what we are learning with you.

Maple syrup is increasingly subject to growing array of regulations with the ongoing rollout of the 2011 Food Safety Modernization Act. Future Generations is following these changes closely and ready to assist with navigating these new regulations and production requirements. We are also planning to develop a standard approach to generating Hazard Analysis Critical Control Point (HACCP) plans for syrup producers and provide on-site coaching services and pre-inspections.

Last but not least, the finishing touches were put on the cookbook project in December 2020. Appalachian Maple: Recipes & Stories from the Mountains is now available for bulk purchase from Future Generations to anyone that wishes to sell it through their maple business. (Contact [syrup@future.edu](mailto:syrup@future.edu) to bulk order cookbooks). Individual copies can be purchased through online book retailers starting later this spring.

We look forward to working with you this year!



Luke Taylor-Ide

---

---

This Newsletter is Published by North Mountain Press

FutureGenerationsUniversity  
Future.Edu

---

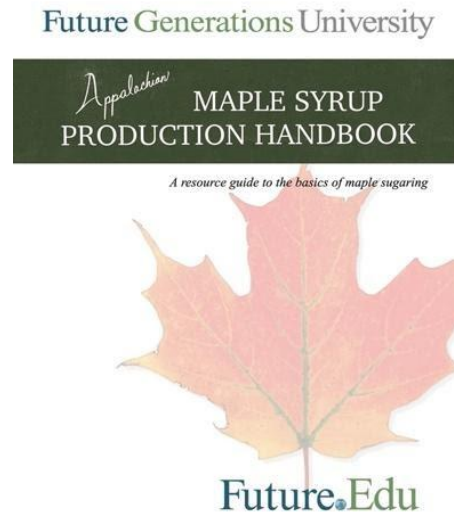
---

## Future Generations University's Maple Certificate Course Goes Virtual

In light of the COVID-19 pandemic, Future Generations University decided to hold their fourth maple certificate course totally virtually, instead of its usual half in-person, half virtual format. Without the in-person portion of the course, Future Generations' maple team used Moodle, an online learning platform, to supplement the virtual class meetings with custom lessons and additional resources. The virtual Zoom meetings were accented with guest lectures from Mike Rechlin and Karen Milnes.

Without the travel commitment of the in-person portion of the class, the certificate course had one of its biggest classes with 24 students, representing many diverse parts of WV as well as a number of different agricultural education organizations. Students were able to immediately apply lessons and concepts to their property, leaving the course with completed woodlot assessments and collection systems drawn.

Looking forward to future maple certificate courses and online maple education opportunities, the Future Generations' team plans to continue providing helpful opportunities to the maple community. Some opportunities on the horizon are the *free* webinar series "Out of the Woods: Enriching Your Maple Business." On January 21 at 7pm, Fred Aherns will be discussing record keeping, and on February 11 at 7pm, Cindy Martel will be discussing how to stay safe in a pandemic while operating your agritourism business. Cindy Martel will also be giving a WV specific regulations webinar, walking through the new "West Virginia Sugar Operation Review Preparedness Manual & Regulatory Guidelines" on January 15 at 7pm. For registration information for the webinars and to download the syrup handbook and regulatory manual, visit [future.edu/maple](http://future.edu/maple).



---

### Daniels Maple Products *Serving All of WV & VA*



We carry a large selection of WV Jugs, 3/16" & 5/16" tubing, mainline, mainline fittings and many other in-stock supplies. We ship anywhere and can order any size reverse osmosis, evaporator, tank or other manufactured items. Please give us the opportunity to serve you.

1747 Morris Branch Road, Dawson, WV 25976  
(304) 575-7266 [wvmapler@suddenlink.net](mailto:wvmapler@suddenlink.net)

---



By  
Mike Rechlin and Dave McGill

Maple syrup makers know that money in a sugaring operation is made in the woods. Yet, often we put the majority of our time and investment into improving our sugarhouse while giving little thought to the sugarbush. In this article we make a case for caring for your woods and how the professional approach to syrup making, promoted by the West Virginia Maple Syrup Producers Association, combined with the professional approach to woodlot management, promoted by the American Tree Farm system, can lead to a healthier and more productive sugarbush. In this article we are going to be looking at the Laurel Fork Sapsuckers sugarbush.

The Laurel Fork is a WVMSPA member and owner Ronnie Moyers has been a Tree Farmer for over 30 years. In 2019 Ronnie was voted the Virginia Tree Farmer of the year. Ronnie sees many benefits for a syrup maker being a tree farmer; “As a tree farmer you can draw on lots of free advice in management of your woodlot. There are also cost share programs and many educational programs. It makes you take a long-term view of the management of your lands.”



[Generations of Laurel Fork Sapsuckers: Missy, Ronnie, Mason and Joe](#)

Let’s start by thinking through a few questions.

Question #1. - Is your sugarbush just a bunch of trees that you drill holes in, or are you managing your woods to increase the sweetness of the sap? Sap sweetness varies with a number of factors most of which we have no control over. One of which, however, we do

control and that is how many sugar making factories, called leaves, your trees have. At the Laurel Fork Sapsuckers, in Highland County, VA, owner Ronnie Moyer has a maple stand tapped that he thinned over 15 years ago, and a similar stand that did not receive that treatment. By monitoring sap flow and sugar content from those two stands we showed that he increased the sweetness of his thinned trees, resulting in more syrup produced and greater profits for his operation.

## Trees-Making Sugar

**Maple syrup is sweet because all Summer long the trees we tap in the Winter have been making and storing sugar. How do they do it? It's easy.**

Tree's leaves use the sun's energy to convert carbon dioxide from the atmosphere and water from the environment into oxygen and sugar.

That added inch of diameter growth came with expanded crowns and more leaves to catch the sun's energy, making more sugar and sweeter sap.

In 2018, as part of a research project, Laurel Fork Sapsuckers began measuring the sweetness of the sap collected from trees in this thinned area and in a similar, un-thinned area. Sap from the thinned area had an average sugar content of 1.5 Brix, whereas the un-thinned forest had an average of 1.3 Brix.

Using the Jones rule of 86

**$86 \div \text{Brix} = \text{number of gallons of sap needed to make 1 gallon syrup}$**

we determined that it takes 57 gallons of sap from this area to make a gallon of syrup, versus 66 gallons of sap from the un-thinned area.

That might not seem like a lot, but it equates to 0.8 quarts of extra syrup per gallon made, which at today's prices equals a \$16 bonus per gallon, and less time and energy spent evaporating.

Trees use that sugar to grow bigger, making new leaves which make more sugar.

In 2002, as an experiment, this area of the forest was thinned. Some trees were cut down, giving more sunlight to the trees that remained which allowed them to grow more leaves and make more sugar.

Comparing this area to a similar un-thinned forest, the trees here have an average diameter of 15.6 inches, whereas the un-thinned forest has an average diameter of 14.6 inches.

In 2018, as part of a research project, Laurel Fork Sapsuckers began measuring the sweetness of the sap collected from trees in this thinned area and in a similar, un-thinned area. Sap from the thinned area had an average sugar content of 1.5 Brix, whereas the un-thinned forest had an average of 1.3 Brix.

Using the Jones rule of 86

**$86 \div \text{Brix} = \text{number of gallons of sap needed to make 1 gallon syrup}$**

we determined that it takes 57 gallons of sap from this area to make a gallon of syrup, versus 66 gallons of sap from the un-thinned area.

That might not seem like a lot, but it equates to 0.8 quarts of extra syrup per gallon made, which at today's prices equals a \$16 bonus per gallon, and less time and energy spent evaporating.

**Question #2. - Is your sugarbush just a bunch of trees that you drill holes in, or is your sugarbush an investment from which you expect to reap benefits over the long term?** Trees grow, and as they grow, they increase in size and value. Elderberry Ridge is an area Ronnie planned on tapping. Prior to putting in his lines he conducted a thinning. The thinning removed mature non-maple species, many of which were ash trees being killed by the emerald ash borer. By thinning before tubing he reduced the chance of dead ash falling on his sap lines and provided space for his maple trees to grow. The elderberry ridge thinning provided more than enough income to pay for the tubing system.

## Economic Study of Elderberry Ridge

Sustainably managing a forest not only increases growth of residual trees and sugar content of sap, but can provide a revenue stream for the landowner. This can be very helpful in offsetting some of the initial investment of establishing a sugarbush.

Here on "Elderberry Ridge," the forest was harvested prior to establishing a sap collection system. Afterwards, an inventory was conducted, establishing 6 permanent sample plots by which the forest's health and growth will be monitored over the coming years. By measuring trees within these plots and extrapolating it to a per acre basis it was determined that the post-harvest stand trees had an average diameter of 11.2 inches, that there are 123 trees/acre, and that the average Basal Area of the stand is 115 sq. ft./acre.

Foresters use this information and a Stocking guide (below) to determine the growing condition of the stand.

Plotting 123 trees/acre on the X axis and a Basal area of 115 sq. ft./acre on the Y axis and extending the lines (red) to where they intersect is a guide to the stocking condition of the stand. Above the swooping "A" line on top are overstocked stands that need further thinning to keep growing. Below the "B" line are understocked stands that need to be let grow before any subsequent thinning. You can see by the red dot that this Elderberry Ridge forest, after the thinning, falls between these two lines.

Ash salvage from Elderberry Ridge.

Planting elderberries for species diversity

On managing a forest for sap production, other ecological values and services should also be considered. On Elderberry Ridge, almost 20% of the trees remaining in the stand are not sap producing sugar maples. These species provide diversity in the forest, increase habitat for wildlife and birds, and are a future revenue source as they grow in value.

The thinning on this 9.5-acre stand removed 10,277 board feet of lumber and 78.2 tons of pulpwood which sold for \$10,846, or \$1,141 per acre. This stand has 109 maple trees/acre and would cost an estimated \$6 per tap or \$659 per acre (6 x 109) to establish a 3/16-inch tubing system.

Each forest is different, but here on Elderberry Ridge, the revenue generated from the thinning easily covered the cost of establishing the sap collection system.

*Question #3 – Is your sugarbush just a bunch of trees that you drill holes in or is it a natural community providing you and society with an array of goods and ecological services?* A woodlot, and particularly a cool moist woodlot dominated by maple trees, is an ideal site for the propagation of a variety of valuable non-timber forest products (NTFP's), critical wildlife habitat and the provision of ecological services such as clean water and sequestered carbon. The sale of NTFP's can provide a sugarbush owner with additional revenue streams, and the management costs of managing with an eye for maintaining wildlife habitat and ecological services is often eligible for government cost sharing programs.

## Intercropping A Sugarbush with Non-timber Forest Products (NTFPs)



American ginseng *Panax quinquefolis*




You may have berries amongst your Sugar Maples. Picking berries is an important recreational activity. These also offer excellent seasonal wildlife food.

Non-timber forest products or NTFPs include several plants and products that are naturally found in this region of the Appalachian Forest. Ever since this area was settled, these products and services have played an important role for those living here – providing nutritional benefits, shelter, fibers, and ways to add income for the settlers here. NTFPs include edible plants, medicinal products, herbal or dietary supplements, fiber and decorative products, and specialty wood products. In addition to maple syrup, NTFPs include mushrooms, roots, nuts, berries, bark, wood for carving & turning, fibers, and foliage. Here we are planting medicinal and dietary supplements such as Ginseng, Goldenseal, and Black Cohosh. These are NTFPs a landowner can plant amongst the maple trees and serve as good examples for the region.

**Intercropping a sugarbush with NTFP plantings will:**

- Provide cover for NTFP plantings – protecting them from wind and extensive sunlight
- Offer high-value (herbal/healing) products that complement maple syrup
- include a variety of options moving away from focus strictly on timber
- Add seasonal income sources when maple syrup is not produced
- Produce products and services that supplement current farm production and income
- Mimic the natural forests in this region
- Strengthen management, planning and development of woodlots
- Add to long heritage of regional forests providing NTFPs



Morels *Morella angusticeps* & Ramps *Allium tricoccum*



Turned wood pieces from this sugarbush

## The American Tree Farm System

Being in touch with other maple syrup producers through the WV Maple Syrup Association brings you current information, camaraderie, and confidence in your sugaring operation. The same can be said for being a member of the American Tree Farm System. Certified Tree Farms are evaluated for their “sustainability”—the assurance that the woodland resources used today will be available for future generations. As such, tree farmers can discover new ideas from other members of the program, professional foresters, and conservationists, and they are confident that the activities they do in the woods will lead towards their “ideal woodlands.”

To become a member of the Tree Farm program, a woodland owner must have a minimum of ten acres and a management plan that addresses all certification standards and performance measures. Some of these performance measures include plans and activities related to invasive species, special historical or archeological sites, use of chemicals and prescribed fire, and threatened and endangered species. These performance measures are part of most forest management plans and can be easily obtained from your county forester or local consulting forester. Once a woodland owner has a plan, the property is inspected by a certified Tree Farm inspector who completes an inspection report for inclusion in the program.

The Tree Farm program is designed to recognize those who are doing a good job managing their woodlands. In addition to the recognition, networking, and educational opportunities, the West Virginia Tree Farm program also has a college scholarship program for children and grandchildren of Tree

Farmers. Most maple syrup producers are already good managers of their woodlands and would be a welcome addition to the Tree Farm program. Maple syrup is an important forest product and being a certified Tree Farm can be a nice feature of your marketing program.

To learn about enrolling in the American Tree Farm System contact your county forester or email Dave McGill, WVU Forest Resource Management Extension Specialist, at [dmcgill@wvu.edu](mailto:dmcgill@wvu.edu)

## Exploring the Economic Potential of Black Walnut

by Erin Shaw

Hello, WVMSP Members! This past fall, I was brought on as the project coordinator/graduate assistant for a West Virginia University research effort focused on black walnut management to increase economic opportunities for WV landowners. Goals of the project include producing an economic assessment of black walnut production, homing in on a growth and yield model applicable to our corner of the world, mapping the distribution of black



walnut across the state, creating map projections of future distributions, building a network of West Virginia black walnut growers, and reaching out to landowners regarding the benefits of planting this high value, multi-purpose tree species.

As I continue diving into this project, it has been especially interesting to learn about black walnut's potential for syrup production. The feasibility of developing a walnut tapping program in WV,

as well as the overall economics of producing walnut syrup on a farm, will continue to be aspects of my graduate work over the coming months. Exploring the viability of both tapping and growing black walnut for veneer is an area of particular interest, and I welcome any insight, advice, or questions from this community of syrup producers. I can be reached at [eshaw4@mix.wvu.edu](mailto:eshaw4@mix.wvu.edu).

## **The Robert C Byrd Institute of Advanced Manufacturing (RCBI) initiative to expand use of specialty crops (Including Maple Syrup) in craft beverage production**

West Virginia's burgeoning craft beverage industry is getting a boost from a new Robert C. Byrd Institute (RCBI) initiative to expand the use of specialty crops in state-made drinks.

"The number of craft beverage producers in West Virginia has nearly tripled since 2014," said Bill Woodrum, director of entrepreneurship and agricultural programs at RCBI. "We want to help residents capitalize on this momentum and connect them to local sources for their ingredients."

RCBI is teaming with Eastern West Virginia Community and Technical College in Moorefield and Unlimited Future and the Wild Ramp in Huntington on the statewide effort to expand cultivation of specialty crops for the craft beverage market, connect growers to bottlers that need specialty crops and promote the use of locally grown fruits, vegetables, berries and herbs to produce craft beverages.

The collaboration will include a series of networking events, seminars focusing on specialty crop production and their utilization in craft beverages and spirits, as well as an extensive marketing campaign to promote the growing of specialty crops and their use in beverage production.

"Our goal is help at least 200 state farmers boost sales of the crops they already grow or expand by growing new specialty crops while encouraging bottlers to create additional product lines," Woodrum said. "We believe these efforts will result in meaningful sales increases for both farmers and craft beverage producers."

Funding for the project is provided by the U.S. Department of Agriculture's Specialty Crop Block Grant Program, which is administered by the West Virginia Department of Agriculture. For more information, contact Woodrum at [bwoodrum@rcbi.org](mailto:bwoodrum@rcbi.org) or 304.781.1670.

*\*\* CELEBRATING 30 YEARS: RCBI delivers expertise and innovative solutions with leading-edge technology to advance manufacturing and entrepreneurship.*

## **CURRENT MAPLE RESEARCH ACTIVITIES AT WEST VIRGINIA UNIVERSITY**

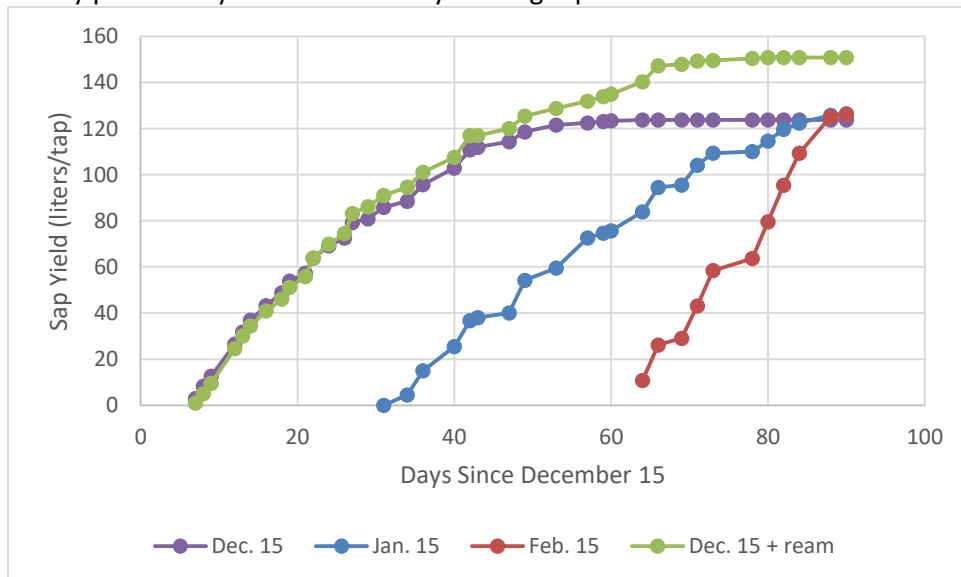
By Jamie Schuler

As we start the new year, I wanted to give you an update on our most recent activities and upcoming research projects. Last year was an active year. As part of a continuing USDA-funded grant in collaboration with WVDA, we are tasked with assessing techniques to improve sap yields under a changing climate. Below I summarize some of these projects.

## 1. Effect of tapping date and tap hole reaming on sap yields

Warmer winters and early springs suggest early tapping may be necessary to capture more sap runs. However, tap holes drilled early tend to stop producing sooner. Reaming or redrilling holes has been suggested as a technique to extend the production of tapholes. Our experiment examined sap yields associated with three tapping dates (Dec. 15, Jan. 15, and Feb. 15) plus one additional treatment where tap holes were drilled on Dec. 15 and redrilled to the same depth on Feb. 15. We monitored sap yields daily on 8 trees per treatment, all under 23-25 inches of vacuum. Monitoring ended on March 13, 2020.

Figure 1 shows sap yields over time. The reaming treatment had the highest yields. The no reamed treatments had 17 - 18% lower yields compared to the Dec. 15 + ream treatment. Prior to the reaming treatment, only a small difference was noted between Dec. 15 treatments (<9%). Although the reaming did increase yields, the increase lasted only about 10 days. Interestingly, the other treatments suggest that tapping date had almost no effect on yield. All three tapping dates were extremely similar. These are very preliminary results. The study is being repeated in the 2021 season.



## 2. 3/16" gravity systems with 3/16" and 5/16" droplines

Some producers are having excellent results with 3/16" tubing in areas with good elevation drop. Others are noting significant declines in production after the first or second year. Most data suggest this decline is probably due to debris and bio-films plugging the small diameter lines, especially at fittings. Anecdotally, the producers having good success are ones that have fairly intensive sanitation procedures.

High levels of natural vacuum are created when the 3/16" tubing is full of sap. In many cases, this natural vacuum rivals that of vacuum pump common on 5/16" systems. During freeze events, a drawback can occur where sap is pulled back into the tree during negative pressure periods. This leads to contamination, which causes premature tap hole "drying". Check valve sprouts have been effective in blocking this reverse flow, but they are also subject to failure and are more expensive. Another option might be to limit drawback by increasing the size of the dropline. The larger diameter tubing reduces capillary action and carry more gases thereby reducing potential for drawback.

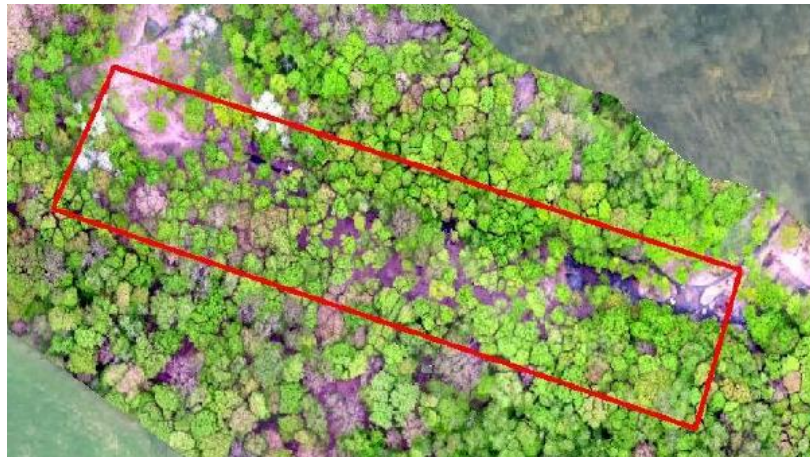


We tested this hypothesis on eight separate lines at the WVU Farm Woodlot. All lines were located on the same slope. Using an existing 3/16" tubing system, four lines were designated to have 3/16" droplines. Four additional lines were modified to have 5/16" droplines on the 3/16" lateral lines. Both treatments used new traditional spouts.

Results show a slight increase in production associated with 3/16" droplines (13.2 gal/tap) compared to 5/16" (11.5 gal/tap). However, the variation among treatments was very high and the differences were not significant. We are repeating this test again in 2021, so these again should be viewed as preliminary results.

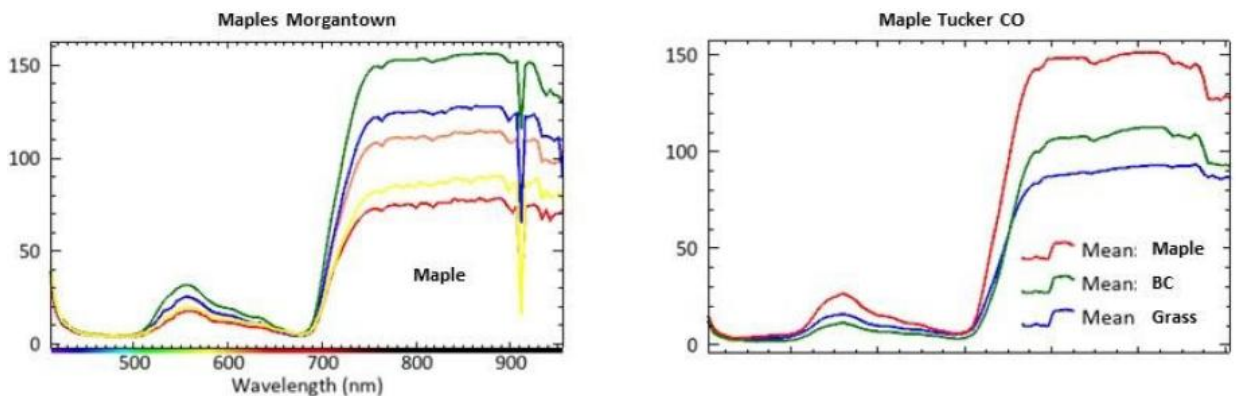
### 3. Taking advantage of newer technologies to improve maple tree detection

This project uses a combination of cutting-edge cameras, LiDAR, and hyperspectral sensors available at West Virginia University (WVU) and the Natural Resource Analysis Center (NRAC) with the goal of using UAV (e.g. drones) to quickly and accurately assess forests for areas with high concentrations of maple trees. A recent graduate student, Sam Bearinger, created a procedure for this work. Starting with high resolution imagery (figure 3), trees (crowns) are mapped.



High resolution orthophoto of study site.

A hyperspectral camera is then used to detect wavelength signatures reflected by the trees. Sample patterns are shown below (figure 4). The results from our initial flights show that maple trees are more variable than expected and likely varies over the season.

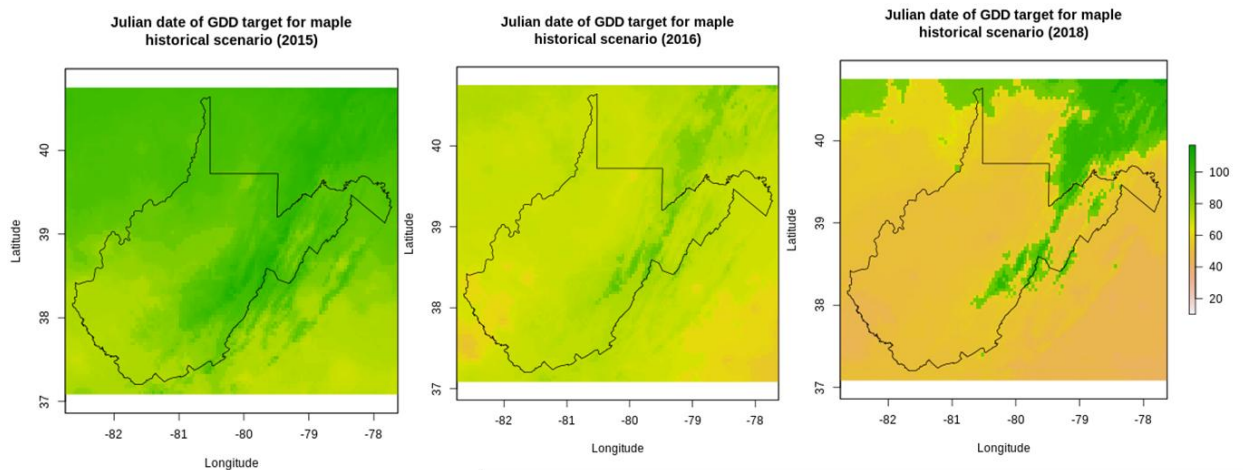


Results from hyperspectral images of two separate maple populations.

While somewhat discouraging, we are going to revise and revisit our approach over the upcoming summer. We are planning to use a different camera system and sample at different times during the summer to test the effect of timing on wavelength signatures.

#### 4. Twenty-year comparison of sap production season

There has been much discussion related to the impact of climate change on maple sap seasons. Many have speculated that the overall warming trend has shortened the sap season. Unfortunately, data to make direct assessments of climate change on long-term sap production are limited and generally confounded by changes in technologies and production techniques over time. Flowering is often used as a metric to mark the end of the sap season (though we recognize that many stop earlier). Although we don't have flowering data over time for the region, we can use the average number of growing degree days that sugar maple begins flowering as a proxy. Using climate data for the entire state on a 4 km pixel grid, we calculated the flowering date for each cell for each of the last 20 years. Figure 5 shows an example of temporal and spatial trends for 2015, 2016 and 2018.



Trend analysis is our next step. Basically, for each pixel, we will look for a positive, negative, neutral pattern over the 20-year period. We will then look for discrete spatial patterns across the state. I expect this work to be completed by May!

#### Upcoming activities

Our latest research focus is on sugarbush management. Our forests, along with the factors affecting their development, vary across the landscape. We know maples grow differently; we know maples have different pests and diseases affecting them; we know that climate factors affect trees differently across the maple growing region. However, sugarbush management guidelines generally are written regionally. Maple-dominated forest in southern ranges (e.g., OH, WV, PA, MD, VA, KY) are compositionally different and development different than forests in New England or the Lake States.

We have assembled a team of experts in forest management, forest operations, and forest pathology to develop new guidelines that characterize our southern maple-dominated forests. We have two graduate students that will work on this project. One will focus his efforts on the forest management, while the other will focus her efforts on identifying diseases and pests in these woods. If you are interested in having your sugarbush inspected as part of our research, please let me know. And many thanks to those that have already volunteered!

West Virginia Maple Syrup Producers Association  
**Membership Application 2019** (revised10/2018)

Purpose:

“The purpose of the West Virginia Maple Syrup Producers Association is to promote, educate, and research the maple and other tree syrup as well as value-added syrup products throughout West Virginia.”

Membership:

“Membership is open to persons interested in maple or firms engaged in any phase of producing, processing and/or marketing maple syrup, and/or tree syrups and value-added products of maple syrup and other tree syrups.”

**We invite you to join with us as we learn and promote our industry.**

Name: \_\_\_\_\_

Farm/sugarhouse name: \_\_\_\_\_

Membership category (check one):

\_\_\_\_\_ West Virginia members. (With full voting rights).

\_\_\_\_\_ Associate and Honorary members. This category is for friends from other states who want to join our organization. (Without voting rights)

\_\_\_\_\_ I give permission for my contact information to be shared with paid members.

\_\_\_\_\_ I do not give my permission to share my contact information with paid members

Address:

Phone number:

cell:

Email address:

**Annual dues: \$25** includes

- Maple Syrup Digest Subscription
- Biannual Newsletter
- Workshops on relevant sugaring topics
- Participation in WV annual maple weekend

Complete application and submit with your annual dues of \$25 by May 2, 2021  
(make checks payable to WVMSPA)

TO: Keith Heasley, 2988 Compressor Station Rd Bruceton Mills, WV 26525

West Virginia Maple Syrup Association  
2988 Compressor Station Rd  
Bruceton Mills, WV 26525