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Promoting the Wise Use of Indiana's Forest Resources

Pawpaws: Winding Road to Pawpaw Heaven

By George Hale

I have always been interested in forestry and had pawpaw trees in the understudy of my forest. But my first real introduction to pawpaws came when I read an article in a forestry publication looking for volunteers to collect emerging pawpaw leaves from wild native stands. Kentucky State University was studying the effects of various pawpaws in cancer research. This sounded like a worthwhile project. I gathered samples from my forest, as well as from people I knew in southern Illinois, southern Indiana and central Ohio. At my own expense I shipped the samples in coolers to Dr. Kirk Pomper at Kentucky State.

Becoming acquainted with Dr. Pomper and his team led me to better understanding of pawpaws. Through him I became acquainted with Chris Chmiel of Integration Acres, founder of the Ohio Pawpaw Festival.

My wife and I attended the 1st Ohio Pawpaw

Festival. I was fortunate to win one of the cooking contest prizes with my pawpaw bread. That got me hooked and I have attended most of the festivals since, entering the cooking contests with winning pawpaw smoothie, pawpaw tres leches cake and pawpaw crème brulee to name a few.

My interest in pawpaws grew, and I attended a Kentucky State University field day and seminar. Kentucky State is the leader in pawpaw research, and I ultimately attended several of their seminars, which were well attended, including international nursery representatives. At the first seminar I attended I met Neal Peterson of Peterson Pawpaws. Neal selected pawpaws with favorable characteristics and bred them to produce new varieties with excellent taste and size compared to most native varieties. At the time I gave him his largest order: 40 grafted seedlings in Shenandoah, Susquehanna and Rappahannock varieties. Ten were planted at my Columbus, Ohio back yard and the rest at my Indiana farm. The Indiana trees were planted in the understory of my walnut plantation since it is by nature an understory tree. When the second weekend of September rolled around, I had fruit from both places to enter in the Ohio Pawpaw Festival contest for "Best Pawpaw", where pawpaws are judged on nine characteristics. Over the years I have won various prizes

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George in heaven as he prepares pawpaw pulp

"tropical fragrance"

Calendar of Events

October 1

Walnut Council field day St Joseph County Contact 765-490-4334 for more info.

October 6

Forest Management and Selling Timber: Women 4 the Land webinar

12:00 pm - 1:00 pm

Free. Register: https://women4theland.org/upcoming-events.

October 8

Forestry field day- Perry County
More info: 812-482-1171 x 3, duboisswcd@gmail.com.

October 8

Invasive plant ID walk.
Washington, Daviess County
More info: 812-482-1171 x3, Emily.Finch@in.nacdnet.net.

October 18

Breakfast with a forester 8:00 am - 9:30 am ET American Table Restaurant, Warsaw Free, no registration required.

October 19

Forestry & Invasives Women's Conservation Learning Circle: Montgomery County 8:00 am - 4:00 pm Free. Register at www.montgomerycoswcd.com.

October 22

Forestry Workshop 9 am — 12 pm Floyd County Info at 812-945-9936.

November 4 - November 5

Annual Woodland Owner Conference Clifty Falls State Park, Madison Learn more at www.ifwoa.org/events

November 15

Breakfast with a forester 8:00 am - 9:30 am ET Christos Family Dining, Plymouth Free, no registration required.

December 20

Breakfast with a forester 8:00 am - 9:30 am ET Dutch Cafe, Peru Free, no registration required.

Event information:

Upcoming local invasive species management events in your area:

See https://www.entm.purdue.edu/iisc/ for times, locations, contact info.

See all forestry and wildlife events for woodland owners at www.ifwoa.org/events.

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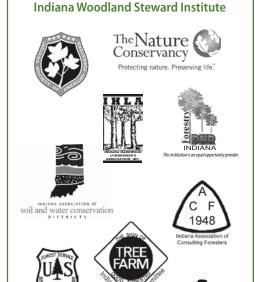
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The opinions expressed by the authors do not necessarily reflect those of the Woodland Steward Institute. The objectives of the newsletter are to provide general and technical natural resource information to woodland owners of Indiana, improve information distribution and build support for responsible forest resource management.

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Pawpaw Heaven Continued from page 1

with my pawpaws, including "Biggest Pawpaw" in 2009. It was 17 ounces, compared to the average in the wild of 6 ounces. Winning has been fun and encouraged me to keep going with this hobby.

In the fall of 2015 we planted forty grafted Peterson Pawpaws, obtained from the Forrest Keeling nursery north of St. Louis, Missouri. They are mostly Wabash and Shenandoah varieties. Although pawpaws tend to be an understory tree, when planted in the sun, such as my plantation, they grow faster. I installed a drip irrigation system with a timer. This year we upgraded to a wi-fi capable timer so we can adjust the watering whenever we want from wherever we are. We also hand fertilize each tree a couple of times a year.

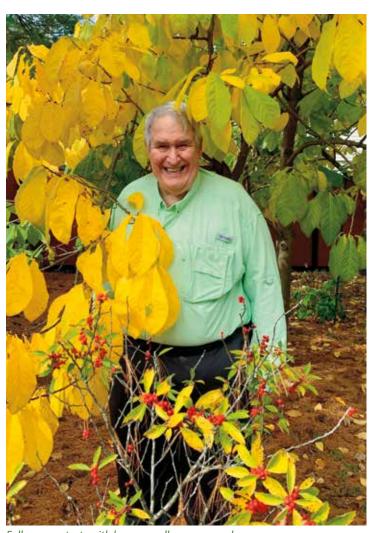
Pawpaws have led to new friendships. I reconnected with an Indiana friend from 4-H days, Mark Hildebrand, who is another pawpaw enthusiast. He helped plant my pawpaw plantation, took fruit entries to the Festival when I could not attend, and grafted some trees for me.

In 2019, we won second place "Best Pawpaw" with a Wabash from the plantation, among the first fruit to have from those trees. Last year's "Best Pawpaw" came from a NC-1 variety tree in the plantation. The NC-1 variety was developed in 1976 in Canada by crossing two other varieties. We had fruit from such young trees because they are grafted. Grafted seedlings have a big advantage of yielding quicker results. Quite a number of nurseries now have improved grafted seedlings available. In a few years when the plantation produces larger volumes of fruit, I hope to connect with a winery or brewery to sell my fruit as pawpaw contributes to excellent wine and beer.

As mentioned at the beginning of this article, I started out wanting to help someone else. In the end, I have an interesting hobby. Pawpaw is now Ohio's official native tree. For years, most people I talked to had never heard of pawpaws, but now I am running into more people that are aware. The Ohio Pawpaw Festival in September is always a great family-fun event near Albany and Athens, Ohio. Some people call me Pawpaw King or Pawpaw Man since I have won so many prizes. I have a wall full of plaques I have received.

An interesting fact: if you find yourself in the forest without insect spray, crunch up pawpaw leaves and rub them on your skin. It may smell like diesel, but it should keep the insects away.

This winding road to pawpaw heaven has been very interesting and rewarding. By meeting researchers, nursery people and fellow enthusiasts that love the pawpaw, I have found a satisfying pastime. From harvesting in early fall to freezing the pulp to make treats later, flavors and friends make a pawpaw heaven.



Fall season starts with banana yellow pawpaw leaves

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The Birders' Dozen Profile 4: Worm-eating Warbler

Dr. Jessica Outcalt, consulting bird biologist

Welcome to the Birders' Dozen! Over the next several issues, we are going to continue introducing the bird species from Forestry for the Birds. The Birders' Dozen are forest birds that can benefit from targeted management practices, as most are declining due to habitat loss. We've curated this list to cover a wide range of habitat types, from young to mature forest, open to closed canopy, or dense to non-existent shrub layers. Our goal is to engage landowners and foresters in the process of managing forests for wildlife, or "forests for the birds."

The Worm-eating Warbler is the fourth bird in our list, and unlike last issue's Baltimore Oriole, inhabits a much more specific habitat type with unique requirements. Its name comes from its food preferences for caterpillars, historically called "worms" – the American Woodcock from our second profile actually eats more earthworms than the Worm-eating Warbler does! This warbler breeds primarily in large forests of southern Indiana, one of the few species on our list that doesn't regularly breed across the entire state.

Natural History

The Worm-eating Warbler is named for its habit of gleaning caterpillars ("worms") from leaves, most often in the understory along slopes. Though its range does not extend across the entirety of the state, it is nonetheless an important Central Hardwoods species. Primarily considered a mature forest specialist, the Worm-eating Warbler also spends considerable time in dense, shrubby patches within forest landscapes.

The Worm-eating Warbler is found primarily where large areas of mature forest intersect with slopes and patchy shrubs. Sensitive to the overall area of a forest, these warblers nest on the ground hidden in low shrubs or leaf litter. Nests are often found near streams or wetlands, and in high densities within large forest tracts. Females build cup nests, and lay clutches of 4-6 small, speckled, and cream-

colored eggs which hatch in just under two weeks. Nestlings fledge around 10 days after hatching.

Despite their pattern of mature forest utilization, habitat use during the post-fledging period (the time just after young birds leave the nest) in this species is unusual. In some areas, Worm-eating Warblers during the post-fledging period are among the most abundant birds in regenerating clearcuts. Short, dense vegetation, such as that found in clearcuts, is used in high numbers by these and other mature forest birds during this critical time, likely due to food availability and shelter from predators.



Worm-eating Warbler, photo courtesy Matt Williams Nature Photography.

The Worm-eating Warbler migrates along the Gulf and East Coasts to its wintering grounds in the Caribbean and Central America, where it forages on insects and spiders. Fall migration generally peaks in late August or early September in Indiana, and spring migration peaks around early or mid-May. Dense shrub layers in the understory are important migratory habitat for these birds.



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Habitat Management

Management for Worm-eating Warbler should be informed by both landscape- and nest-level characteristics. Large mature forests and presence of steep slopes are important landscape-level characteristics predicting warbler densities, and leaf-litter depth and shrub cover are important at microsite levels. In addition, presence of early successional, open areas near large tracts of mature forest can benefit warblers during the post-fledging and migratory periods.

On a large scale (hundreds of acres or more), Worm-eating Warblers depend on mature forest and steep slopes, which is part of the reason their range is restricted to southern Indiana. Ecologists often talk about "source" and "sink" habitats for wildlife, where large, high-quality habitats act as sources for population growth, but smaller low-quality areas cannot support growth. Large mature forest tracts can be sources for Worm-eating Warbler populations, areas that foster strong breeding populations.

Managers of large forest tracts should maintain healthy, mature forest with dense shrub patches to benefit warbler populations. Forest fragmentation is one of the primary threats to Worm-eating Warblers, so maintenance of connected forest is important for conservation of these charismatic birds. In particular, Worm-eating Warblers seem to use patches on southwest-facing slopes for nesting, so targeted management towards those areas can be beneficial.

On a smaller scale, such as management within your property, creating and maintaining habitat in which Wormeating Warblers can breed will be beneficial. Dense shrub patches and a well-developed leaf litter layer, especially near oak stands, can be beneficial for nesting success. In addition, open areas such as those that result after clearcuts can be beneficial habitat during the post-fledging and migratory periods.

Conclusion

Though the Worm-eating Warbler's habitat requirements seem daunting at first, targeted management for these

charismatic little songbirds can benefit the entire forest ecosystem and provide breeding habitat for many other birds as well. Providing both mature forest tracts in areas with steeply sloped terrain for nesting habitat and young forest clearings for post-fledging and migratory habitat can greatly benefit declining populations of Worm-eating warblers, for the benefit of both birds and people.

Special thanks to the Alcoa Foundation, the Indiana Forestry Educational Foundation, and The Nature Conservancy for their support and leadership of Forestry for the Birds.

Jessica Outcalt, PhD was an independent consulting biologist who worked with The Nature Conservancy to develop the "Birders' Dozen Profiles." She is now an Agriculture and Natural Resources educator with Purdue Extension in Grant County. She completed her BS in biology at Taylor University, her PhD in wildlife ecology at Purdue University, and is passionate about birds and getting people involved in conservation and scientific processes.

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Assessing White-tailed Deer Browsing in Woodlands

By R.D. Sample

It is likely no surprise to many Indiana woodland owners that white-tailed deer can cause problems. Research has shown that deer feeding or browsing on tree seedlings reduces growth, reproduction, and survival, and promotes species that deer do not like to eat, including many non-native plants. Many woodland owners seek to control their deer populations through hunting to reduce damage to seedlings and other plants. However, the number of deer needed to cause damage may vary from property to property, so being able to monitor the impact deer have on your woodland with differing population sizes is helpful. Luckily, many methods exist that can monitor browsing intensity on woody species, which can be used to guide decisions on how many deer a woodland can support. Researchers from the Purdue Integrated Deer Management Project (https://ag.purdue. edu/fnr/researchindeer/) have been evaluating four different methods of monitoring deer browsing intensity on woody species across the northern, central, and southern regions of Indiana. These methods are known as the percent browsed method, the twig age method, the oak sentinel method, and the stump sprout method.

The percent browsed method involves counting the number of twigs available for deer to browse and the number of twigs that are browsed by deer for species that are commonly eaten by deer. These counts allow the calculation of browsing intensity, which is the percentage of the available twigs that

are browsed (Figure 1). This method is the most direct way of measuring browsing intensity, so it can be used as a baseline to compare how well other methods work. The twig age method works by counting how many years it has been since a twig was browsed, which is done by counting the annual growth scars on a twig. Sugar maple and ash species are great to use, since they are often highly available, browsed by deer, and their growth scars are easy to recognize. At the beginning of each growing season, when new twig growth begins, scar tissue forms where the bud was set. The number of scars on a twig represents how many years old that twig is. By counting how many scars are on a twig until you reach a browsed connected twig, you can measure the twig age (Figure 2). Twig aging stops at a maximum of five years because after that growth scars are harder to see. If the twig you chose to age is browsed, then the twig age would be zero, meaning it was browsed this year. For this method, a lower number (representing fewer years since browsing) represents a higher browsing intensity.

The oak sentinel method involves planting northern red oak seedlings (Figure 3), and returning later in the summer to measure the percent of individual seedlings browsed as the measurement of browsing intensity. The stump sprout method involves felling small diameter trees such as hackberry, ash, or red maple, which will sprout prolifically and are browsed by deer. A small cage is placed over a subset



Figure 1 left: An example of how the percent browsed method works. This stem would indicate a 75% browsing intensity; three out of four twigs are browsed (browsed twigs are circled in red).

Figure 2 right: An example of how the twig age method works. The red circle indicates the twig being aged, while the blue circles indicate growth scars. This twig has a browsing intensity of 2 years, as there are two scars on the twig until you reach the browsed connecting twig (blue arrow).



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Figure 4: An example of caged and uncaged stump sprouts.

of the stumps to protect the sprouts from being browsed by deer (Figure 4). The measurement of browsing intensity is the average difference in height between caged and uncaged stump sprouts, where a greater height difference represents higher browsing intensities.

The early results from this project suggest that each method may be useful for monitoring deer browsing intensities. Browsing intensities calculated with the stump sprout method were similar to those from the percent browsed method. However, the stump sprout method was the most expensive method because it required using cages, and it took 10 times longer than the percent browsed method to complete. Browsing intensities from the twig age and oak sentinel methods were similar to the percent browsed method in the central and northern regions, but not within the southern region. The twig age and percent browsed methods both required no material costs, and took similar amounts of time (~45 minutes per woodland). The

oak sentinel method did require the purchase of seedlings,

which can become expensive if this method is used over a large area. This method also took twice as long as the percentage browsed method because it required two trips to each site, one to plant the seedlings and one to measure browsing later in the summer.

Each method we assessed has pros and cons associated with their use, and many factors will likely influence which method is best for a landowner. If the cost and time spent are the most important factors, the twig age or percent browsed method may be the best option. If you are planning to plant oak seedlings or thin small trees, the oak sentinel and stump sprout methods can be used in conjunction with these planned management actions. Each of these methods

could be useful for monitoring deer impacts over time, as levels of browsing intensity, as measured by these methods, should change with changing deer abundance in a forest. Because of this, we provide suggestions for how to interpret the calculation of browsing intensities from each of these methods (Table 1). For any other questions, please feel free to email Richard Sample at *rsample@purdue.edu*.

Method	High Browsing Intensity	Medium Browsing Intensity	Low Browsing Intensity
Percent Browsed	>31%	10-31%	<10%
Twig Age	0-1.9 years	2-3.9 years	4-5 years
Oak Sentinel	>57%	29-57%	0-28%
Stump Sprout	>49%	22-49%	<22 %

Table 1: Suggestions for classes of browsing intensities from data collected by the integrated deer management project for each method. The values for the stump sprout method is the average reduction in height for uncaged spouts compared to caged sprouts.

R.D. Sample is a PhD Candidate in the Department of Forestry and Natural Resources at Purdue University. R.D.'s work on the Integrated Deer Project focuses on the successional changes of native plant communities that are brought on by deer browsing.





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Tapping into Our Roots

Tamara J. Benjamin and Eric Lee

Indiana has a long history of producing and consuming maple syrup. This natural sweetener was an important part of Native American culture and became revered by the Europeans who settled in the state. By the early 20th century, Indiana was one of the largest syrup producers in the United States.

Maple forests are part of the climax Beech-Maple Forest, one of the most common types of forest in the northeastern United States. Maple trees grow well in a variety of soils and can survive under low light conditions for a number of years. Due to its high sugar content, the sap from a sugar maple (*Acer saccharum*) tree is preferred for producing maple syrup, although syrup can be made from the sap of other maple varieties as well, such as silver (*Acer saccharinum*) and red (*Acer rubrum*) maple trees.

Even though in the past Indiana was a major producer of maple syrup, over time other crops have dominated the state's agricultural landscape. Most row crops, such as corn and soybeans, became mechanized and are preferred over the production of maple syrup. Also, new sweeteners, such as corn syrup and sugar from sugar beets, have entered the market, creating low-cost competition for the consumer's sweet tooth. Maple syrup production in Indiana has diminished significantly over the past century due to world wars, urban migration, The Great Depression, and declining available labor on farms.

Recently, a new crop of producers has started tapping trees, and the supply of maple syrup is increasing as new technology is playing a role in production efficiencies. In 2020, Indiana only accounted for 0.6% of total syrup production in the United States; however, this is up 20% over the previous year.

Maple syrup consumption is also fueling the trend to produce more maple syrup within the state. Consumers want to know where and how their food is produced and are demanding locally-grown or locally-made products. Also, the public is becoming aware of newly discovered human and



Gathering maple sap with buckets – Indiana State Archives

environmental health benefits resulting from the production of maple syrup. Studies have shown that 100% pure maple syrup is packed with over 60 antioxidants called polyphenols, nine of which are unique to maple syrup. For example, the polyphenol, Quebecol, is naturally produced when sap is boiled to become maple syrup. Maple syrup is also high in minerals such as calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc. It is considered to be a "smarter sweetener" and is a healthier choice for those adding something sweet to their diet.

In addition to providing a healthy alternative sweetener to our diets, maple forests also supply key environmental services. For example, maple trees provide important stop-over sites for migratory bird species, including the cerulean warbler, rose-breasted grosbeak, scarlet tanager, eastern towhee, eastern screech owl, and the ruby-throated hummingbird. Beach-Maple Forests sequester carbon and protect water and soil resources. Maple syrup producers maintaining a healthy maple forest can offer habitat for local and migrating fauna, create climate smart practices, and enhance soil health principles.

Maple syrup production is an important source of income for landowners as they can monetize the sap from their maple trees. Maple sap is converted to syrup through a process of collection, vaporization, filtering, and packaging. Indiana maple syrup is sold at multiple venues, including farmers'

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markets, on-farm stands, local grocery stores, online sales, various festivals throughout the state, and at the Indiana State Fair.

The United States Department of Agriculture (USDA) recently funded a Purdue University project titled *Increasing* Consumption and Production of Maple Syrup through an Integrated Marketing Strategy. The project focuses on increasing demand while improving production practices. A consortium of partners, including Purdue Extension, USDA-NRCS, Indiana State Department of Agriculture's Indiana Grown, and the Nature Conservancy, will support the Indiana Maple Syrup Association (IMSA) and other producers across the state to amplify awareness of maple syrup production in the state and to increase consumption. To fulfill the goals of this initiative, the project team, which includes 12 maple syrup producers serving on the advisory board, will focus its efforts on an educational campaign to promote the benefits of maple syrup consumption and the environmental services provided by natural forest systems. The overarching goal of this new project is to tap into the roots of our Hoosier heritage, build community connections across the state among producers, consumers, and other stakeholders, and expand the production and consumption of this truly wonderful natural sweetener.

Dr. Tamara Benjamin was the Assistant Program Leader for Diversified Food and Farming Systems with Purdue Extension. Recently she became Program Manager for Agriculture, Food and Natural Resources at the University of Minnesota. Eric Lee is coowner of Stix2Brix, producing maple syrup in Madison County, Indiana.



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Basics of Maple Syrup Production – Indiana

Dr. Gary Graham

Maple syrup productions often stirs memories of a simpler time in American where almost every landowner was making syrup or sugar cakes to use as their source of sweetener throughout the year. Or it may just stir your sweet tooth and desire for some "Pure Maple Syrup." Syrup production can be conducted on many scales of size whether you have 50 taps or 50,000 taps the process is the same. It is just more work before, during and after the season the larger the operation. If you are wanting to get involved with maple syrup making, there are some basics you should look into:

- Talk to producers around your area. There is tremendous value in talking to folks already producing syrup. Maybe you can sign on to be a helper to obtain more hands-on knowledge. You may be able to take your sap to another producer to boil if you don't have all the equipment.
- Join the Indiana Maple Syrup Association to learn from the members and programs they organize. www. indianamaplesyrup.org/ At Association events, you will meet other maple producers and enthusiast that are great resources for learning from and sharing knowledge with. The price of the membership will pay you back in help, product promotion, and production practices to help your operation as well as staying on top of what regulations are for producing maple syrup.
- Get to know your sugarbush (name for the woods where sap will be collected) long before you start tapping trees. Summer is a great time to study your woods and your maple trees. Mark the sugar maple (*Acer saccharum*) trees that are of tapping size. Also determine how you will collect sap either with buckets or tubing if going that route. You can tag Red Maple (*Acer rubrum*) and Silver Maple (*Acer saccharinum*) trees too, but know that taps in these trees will need to



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Maple sap flows best when temperatures drop below freezing at night and rise into the 40s during the day.

be pulled a week or two before the Sugar maple taps. Red and silver maples will break open their buds a week or two ahead of sugar maples. When this happens the syrup taste bad due to the release of different carbohydrate compounds the tree sends to the buds to help them break open into leaves.

• Implement good forest management practices. This does not mean cut down everything but the maples. A monoculture (one species) is never a good management practice. Work with a forester to make decisions of what should be cut out to allow the maples to grow better and even what maple trees need to be cut down. Yes, cutting down some maples will make the rest grow better. It is called "Crop Tree Release" and there are many online information sources to read more about it. The health, longevity, and future of your maple syrup hobby or commercial operation starts within the woods. You make money in the woods with proper management practices, you spend money in the sugarhouse on shiny things you may not need.

- Buying equipment. This is the largest cash layout to getting started in maple syrup making. I highly suggest before you buy one piece of equipment you talk to multiple dealers and maple producers who have different types and different manufacturers of maple production equipment. There is no one best brand (equipment dealers will disagree with me) but they all do the same thing. Some do it slightly different giving faster production or more efficiency. Learn what people like and dislike about the equipment they have. Don't get caught up in the maple syrup disease I refer to as "shiny-gadget-syndrome." Many folks spend a lot of their time and money in the sugarhouse with shiny things that may or may not increase the bottom line. But as I said above maple syrup production starts in the woods.
- When looking into the many choices in equipment consider several factors. First, how many taps you're going to start with versus the total if you tapped everything you have. Plan on expansion. I know so many people who bought a small evaporator thinking they are never going to tap more than 50-100 trees and get bit by the maple bug and next thing they have 500 taps or more and a small evaporator that requires more hours in the day then they have to dedicate to boiling hundreds of gallons of sap. Second, how much money do you have to spend? The larger the equipment the larger the price tag. Third, how much time do you have to devote to boiling sap? If you're working a job and are a part-time maple producer, then you need to size your equipment needs so you will get some sleep and be able to do your regular job.
- Buyer beware when it comes to buying older equipment.
 Equipment manufactured before 1982 could still contain lead in the metal or soldering. Lead and maple do not go together. Maple sap and syrup is acidic and lead is a soft metal that can be dissolve into the syrup. If in doubt a lead testing kit available at the hardware store will tell you if equipment is lead based. Also soldered seams could be leaking or pin holes can cause problems. If buying it from a known source is better than an add in the paper with prices too good to be true.

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- One of the most important pieces of equipment you will need to purchase is a Vermont Department of Agriculture certified accurate maple syrup hydrometer and a hydrometer cup. You may be asking, why a state certified hydrometer over one that is not certified and cheaper. I have tested hydrometers for over 20 years, and it is amazing how many I have found that are off (inaccurate). Typically, they read heavy, meaning if you boil to the red hot line you are going to make syrup that is too high of Brix's (the amount of sugar in solution). This is bad, for one you are giving away sugar that you could sell. The syrup may turn into glass like crystals at the bottom of the container and that too is lost sugar. Secondly, if Brix are read too light, then you are not getting enough water boiled off and the syrup will be thinner and could spoil from not being at the proper density. A simple \$40 dollar investment could return hundreds of dollars.
- Marketing your syrup needs to be part of the planning. If you're only producing a couple gallons a year, then the big decision is with whom will you share it with. If you have free samples to hand out, you will have more friends and relatives than you previously knew of. If you are going to produce many more gallons then you have family and friends to give it to, you need to know how you are going to sell the product you make. Producers often say "show me how to make more money." To them I say, show me your marketing plan and I can help. Too many people produce the product but don't know how they are going to market it. Marketing your product properly will give you a net return far times more than just selling gallon jugs to whomever stops by the farmgate to get their fix of the sweet stuff. Do you want to make maple confections which will make you even more money per gallon of syrup? Making confections takes more time and you need a market to sell your product to once it is made. Also keep in mind, these confections have a shorter shelf life than syrup in the jug. This is an important step in the process of starting or expanding your maple syrup production operation. Maple production is a great opportunity to use resources (trees,



Excess water is boiled from the sap to make syrup. It takes about 10 gallons of sap to make 1 quart of syrup.

time) not being utilized to their potential. Plus, locally grown food is the hottest market in the food industry. People are paying more attention to what they buy and where it is made. If they know it was made locally that is always a good selling point to market.

There is so much more that could be said about starting or increasing your maple operation. Work through these basic consideration before you get too far along. It will save you a lot of grief and money in the long run to do you homework first. Look to University resources for maple syrup production. Try to avoid peoples personal blogs of web resources, as they may not be giving good advice in all areas.

Resource Examples

- Getting Started With Small-Scale Maple Syrup Production: *cpb-us-e1.wpmucdn.com*
- Maple Sugaring: An Introduction To Small-Scale Commercial Production: https://mapleresearch.org
- Hobby Maple Syrup Production: https://geauga.osu.edu

Gary Graham is a Maple Production Specialist with Ohio State University Extension. He was recently inducted into the Maple Syrup Hall of Fame for his decades dedicated to maple syrup production in North America.

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Ad space available!

Contact Brian MacGowan at macgowan@purdue.edu for more information.

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The Licensed Timber Buyer Law

By Duane McCoy

In the early 1970s several bills had been proposed to limit timber theft in Indiana. One proposal would make it unlawful to cut any Black Walnut tree 24 inches or larger. Another bill would set a penalty of five times the stumpage value of the tree or trees cut and/or damaged with an added fine and possible jail time.

In light of these proposed bills, The Indiana Hardwood Lumberman's Association (IHLA) sponsored one of its own that was passed into law in 1972 commonly called the Timber Buyers Law (I.C. 25-36.5). The Indiana Department of Natural Resources (DNR) Division of Forestry (DoF) administers the law, which has undergone some revisions in the 50 years since its passage, but the goal remains the same; to license Indiana timber buyers while helping the Indiana timber growers pursue justice for bad actors. This law works to protect the timber growers of Indiana and the law-abiding timber buying industry of Indiana.

In the last legislative session, the Indiana General Assembly passed some changes to the Timber Buyers Law in pursuit of the above-mentioned goal, that went into effect July 1. The first is that all timber sales will have a contract that meets a minimum standard, which is defined in the Uniform Commercial Code (I.C. 26-1). The burden of meeting the law is put upon the timber buyers, and it is to be sure that there is a record of the agreement between the timber buyer and the timber grower. If there is no contract, the timber buyer will be in violation of the law. Since many times there can be a timespan between the agreement of the sale and the actual harvest, another change requires timber buyers to keep the records from all timber sales for a minimum of five years. The maintaining of records also allows more evidence for law enforcement should a criminal investigation be warranted.

These changes help both parties if there is a dispute. They also help the timber grower file for what is commonly known as an Administrative Hearing under 312 IAC 14. The Administrative Hearing process is an adjudicative process focused on the I.C 25-36.5 and heard by judges that hear these cases on a regular basis. The system is such that the court can come to the area where the parties are, and can help mediate negotiations, if necessary, rather than going straight to the formal hearing. In order to learn more, see 312 I.A.C. 14 Rule 6.

In the past, the Timber Buyers Law had no provision to request compensation for a lawyer's fees in the case of the Administrative Hearing process. This was changed because there were many cases in the past when a timber grower did not file because the lawyer fees were likely to surpass even

the three times value allowed under the law. This will allow timber growers to file administratively no matter how small the value of the timber in question.

There have been cases in which a person who was being investigated under the Timber Buyers Law for criminal activity was able to keep operating under their Timber Buyer's License because there was no judicial decision or conviction against the buyer. This time lag allowed them to victimize more timber growers before they could be stopped by having their license revoked. A new change to the law allows the DNR Director or their designee to enact a 90-day suspension of the timber buyer and agents license(s) under investigation in order to address this issue.

There are many ways in which timber may be purchased. Lump sum, cut and measure, and shares are the largest part of the list. Does the cost of harvesting the timber come out the Timber Buyer's or the Timber Grower's share? If the timber grower is to be paid a percentage of what the timber buyer is paid for the logs from that particular property, who determined the value of those logs? What trees are to be harvested according to the agreement? What is timber worth on the market at the time of the sale? These questions and more are important for the timber grower to consider before agreeing to sell their timber. However, the law cannot protect those that would sell their timber without these considerations outlined in their agreement.

The DoF and DNR Law Enforcement do the best they can to protect the timber growers and Indiana Forest Products Community as a whole, including those who are law abiding. Please recognize that changes to the law place a burden upon them. In 2016 the law raised the bond requirement for timber buyers to have on file with the state in order to maintain a Timber Buyer's License. The reason for this had been bad actors that had the minimum bond, and the victims who could not recover single stumpage value on judicial decisions awarding restitution of three times stumpage value. For some of the smaller businesses, it is a new burden to have a contract on every sale and maintain records for five years or more, but it allows them to continue to work and help maintain this very important industry in Indiana's economy.

These changes help the forest products community of Indiana if both timber grower and timber buyer have a transparent agreement that both parties understand from the beginning. If one or both parties "glaze over" the particulars and do not list them specifically in the contract, this may contribute to misunderstandings. As a timber grower, if you do not understand or know the timber market you may want to seek help from someone who knows the timber market.

Duane McCoy is a timber buyer licensing forester with the Indiana DNR Division of Forestry. If you have any questions concerning the Timber Buyer's Law, please contact Duane McCoy at dmccoy@dnr.IN.gov or 317-232-4112.

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2021 Indiana Tree Farmer of the Year

By Ken Day

Pence Revington of Mount
Horeb, Wisconsin is the 2021
Indiana Tree Farmer of the
Year. The tree farm is 50 acres
and located in White County.
Revington was selected because
of outstanding stewardship
and willingness to share land
management experiences with
others. She accepted the award
at the Tree Farm Breakfast
at the Indiana Hardwood
Lumberman's Association
convention in Indianapolis on
February 8, 2022.

Forest management has been guided by professional foresters with the goal of a healthy woodland. The

management plan was most recently prepared in 2018. The property has been in the Tree Farm system since 1975.

The woodlands consist of 33 acres of natural hardwoods and 17 acres of planted black walnut. Specific wildlife management practices have been conducted on 7 acres. The most recent timber sale in 2021 involved 9,000 board feet of hardwood sawtimber and 1,000 board feet of veneer. The logger has two years to remove the trees. Previous timber sales and timber stand improvement occurred in 2009 and 1996.

Extensive invasive species control has been implemented over the last five years to eradicate Ailanthus (tree-of-heaven), American bittersweet, Asian bush honeysuckle, autumn olive, and multiflora rose.

Revington most recently hosted a Hardwood University session on the property. To persuade other woodland owners to manage their woods Pence has participated in field days for Indiana Forestry & Woodland Owners



2021 Indiana Tree Farmer of the Year, Jennifer Boyle Warner, Tree Farm Inspector of the Year, Eliza Revington, daughter of Pence, Pence Revington, Tree Farmer of the Year, and Mike Warner, husband of Jennifer.

Association (IFWOA) and Walnut Council and has been featured in videos produced by IFWOA and Purdue Extension. Revington was nominated and selected for the regional IFWOA Deam award in 2020. Jennifer Boyle Warner of ArborTerra Consulting nominated Revington for the 2021 Indiana Tree Farmer of the Year award.

The Tree Farmer of the Year is sponsored by Indiana Tree Farm. Recognition of outstanding professionalism in sustainable forestry practices is one of their objectives. Education is the other objective. Awardees are selected by the Indiana Tree Farm Committee which has 30 members representing a cross section of forestry professionals in the state.

Ken Day is a retired forester and former Woodland Steward Institute board member. Prior to his retirement, he most recently served as Forest Supervisor for the USDA Forest Service, Hoosier National Forest.



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2021 Indiana Logger of the Year

By Ken Day

Werner Sawmill, Inc., Jasper, Indiana is the 2021 Indiana Logger of the Year. Tim and Luke Werner accepted the award at the Tree Farm Breakfast at the Indiana Hardwood Lumberman's Association (IHLA) convention in Indianapolis, Indiana on February 8, 2022. Werner was selected for professionalism, communication, soil and water conservation, concern for long-term sustainability, and training. Their annual production is about 4 million board feet of sawlogs and 40,000 tons of pulpwood.

Werner is noted for excellent utilization including veneer, grade logs, pallet dimension, and chipping. Consulting foresters reference the precision directional felling that reduces damage to residual trees. They use a full complement of equipment including chain saws, dozer, feller buncher, log loaders, and skidders.

Werner uses a strategic approach to remove pulpwood and sawtimber to protect soil and water,



2021 Indiana Logger of the Year, Werner Sawmill, Inc., Jasper, Indiana, Tim Werner (left) and Luke Werner (right)

preplan skidding, and protecting residual trees. To minimize erosion Werner uses tree branches to create a matting to stop soil movement. They utilize bridges to cross small streams. Upon completion of the operation waterbars are installed, and skid roads and log landings are seeded and mulched.

Training has been in integral part of the success of Werner. They have participated in cutter 1, 2, 3, 4, and 5 training, skidder training, best management practices training, and medic first aid and CPR training. Crew members are outfitted with chaps, hard hats, reflective clothing, and steel-toed boots.

Werner is responsive to requests from the consultant and landowner. The staff is attentive, courteous, and respectful to the land owners and their land. Werner was nominated by John Stambaugh of Stambaugh Forestry and Pete Halstead of Indiana Forestry Educational Foundation, Inc.

Logger of the Year is sponsored by Indiana Tree Farm to recognize outstanding professionalism in sustainable forestry practices. Awardees are selected by Indiana Tree Farm Committee which consists of 30 members representing a cross section of forestry professionals in Indiana.

Ken Day is a retired forester and former Woodland Steward Institute board member. Prior to his retirement, he most recently served as Forest Supervisor for the USDA Forest Service, Hoosier National Forest.

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Mechanized Harvesters are the Future of Logging

By Ray Moistner

In logger parlance, the "feller" refers to someone who cuts down the tree, and the "buncher" is the means by which multiple felled trees are dragged ("skidded") out of the woods.

The feller buncher is a mechanized harvester that performs both of these duties. It can grab, cut and stack. Modern equipment can do more, including delimbing and bucking. They come in both wheeled and tracked options, allowing for options based on terrain, weather forest structure.

The original feller bunchers were designed for pine plantation harvesting, where it was very easy to gather large quantities of trees quickly, often on somewhat even terrain. In the past decade or so, they have gradually evolved into models more suited for the hardwood region, where selection harvesting and challenging terrain make them harder to justify based on the investment.

However, those times are changing as the benefits outweigh the costs, and will only continue to increase that gap. The average logger is 58 years old, while the capital required to start a logging company eliminates most young people from getting in the business. Add to that the difficulty and cost in finding insurance and high-risk, long-hours and history of relatively low pay. Those who come into the industry through family can, and do, maintain the operations which is why so many third, fourth and even seventh generation logging business exist in the state.

Other benefits to the logging industry include significant reductions in:

- Stress
- Repetitive motion injuries
- Physical load
- Energy expenditures
- Hearing loss
- Weather-related lost time

The Challenge of Finding Employees

The operators are significantly more comfortable and safer in their work environment, with so much of the physical toll eliminated. The job becomes less about strength and more about hand/eye coordination. They are able to work smarter, not harder. They can lead to better forestry and better silviculture, and logs can be cut to length.

Mechanized harvesters in the hardwood region are most useful in dense stands of young trees that need thinning, but they continue to evolve towards smaller and more nimble machines, which will in turn increase their utilization.

So, what do the logging firms need to consider when taking on the expense and opportunities of switching over to mechanized harvesting?

First and foremost, well-trained operators are the secret to

success. Not only must they be a master of the machine, they must also know when to factor in their usefulness when bidding on timber sales. They must consider stand characteristics, the logistics of the trees marked for felling, the tree dimensions (some are too large for the current equipment), the dimensions of the machines being used, and the skill level of their operator.

"For me, my big things are safety and production," said Joe Crone of Crone Lumber in Martinsville. "It's a safe way of doing what we do and I know it's going to be even safer when my kids eventually take over this business."

What about landowner benefits? Are there any? Will it tear up my forest?

When utilized properly, mechanized harvesters can provide additional protection of advanced regeneration, mostly because the surgical nature of their use causes less damage to residual trees. The workers on your jobsite are safer and in more comfortable conditions. They help insure a timely harvest and whole tree utilization is much easier. The quality control is better and you can assume that the crews are highly-trained. They can also make it easier to install wetland crossings. And let's not ignore the fact that they are fun to watch, if you need an entertainment break.

When asked what a landowner should consider in hiring a logging firm that uses mechanized harvesters, Crone said, "Safety is a big concern for them. There's less mess due to more directional felling, but there can also be more land disturbance from the machinery. They also can count on it being a faster process."

Are there concerns?

Of course there are. In certain conditions, the weight can cause more damage to the land, but BMP's are designed to ensure that conditions are restored. Until the more nimble and smaller units come to market, their use is still limited in the hardwood regions, and the industry is still in the infancy stages of transitioning, so there are not many trained operators out there yet.

In summary, mechanized harvesters are the future of logging, as we see the timber harvesting workforce gradually evolve with them into a very old, multi-generational profession. Reductions in physical toll, insurance costs/availability and increases in productivity will continue to propel the momentum.

Ray Moistner is Executive Director of the Indiana Hardwood Lumbermen's Association. IHLA (www.ihla.org) is a non-profit trade organization comprised of sawmills, wholesale brokers, equipment vendors, secondary manufacturers, loggers, landowners and others who recognize the benefits of working together on issues and projects for the good of the hardwood industry.

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Days Gone By





Black locust logs read to square up (left) for end posts and the finished posts (right). Rutherford Post Mill in Madison, Indiana, circa 1936. Photos by Roy C. Brundage.

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