

Has the maple sugar production process had an impact on slavery over time?



Yancey's Sugar Bush, 1972 by Dante Tranquille
Identifier: F0001.2010(127)x Plowline: Images of Rural New York Collection

Supporting Questions

1. How did maple production compare with cane sugar production in the 1700's?
2. How has maple production been updated over time? Has any of those updates come about due to global warming?
3. Did maple production in North America have an impact on sugar plantations in the West Indies? Why or why not?

Inquiry Design Model (IDM) Blueprint™

Compelling Question	Has the maple sugar production process had an impact on slavery over time?		
Standards and Practices	<p>7.7 REFORM MOVEMENTS: Social, political, and economic inequalities sparked various reform movements and resistance efforts. Influenced by the Second Great Awakening, New York State played a key role in major reform efforts.</p> <p style="text-align: center;"> Gathering, Using, and Interpreting Evidence Chronological Reasoning and Causation Comparison and Contextualization </p> <p>Standards: 1, 5; Themes: SOC, CIV, GOV</p>		
Staging the Question	<p>How did maple production compare with cane sugar production in the 1700's?</p> <p>How does maple production today compare with production in the 1700's?</p> <p>Did maple production have an impact on slavery?</p>		
Supporting Question 1	Supporting Question 2	Supporting Question 3	
How did maple production compare with cane sugar production in the 1700's?	How has maple production been updated over time? Have any of those updates come about due to global warming?	Did maple production in North America have an impact on sugar plantations in the West Indies? Why or why not?	
Formative Performance Task	Formative Performance Task	Formative Performance Task	
Create a chart comparing and contrasting the process of creating maple sugar to creating cane sugar.	Read "Maple Syrup Production for Beginners" and look at the Plowline images. Make a list of the production steps and consider areas you would like to improve with technology. Compare your ideas to what is currently being done to improve maple syrup production. Have any of those improvements come about due to global warming?	Write a paragraph explaining the impact that the production of maple sugar had on slavery. Include your thoughts about labor on sugar plantations today.	
Featured Sources	Featured Sources	Featured Sources	
A. "Notes on the Manufacture of Sugar from the Maple"	A. Maple Syrup Production for Beginners B. Plowline: Images of Rural	A. William Cooper's Town B. USA Today Article	

Tree in the United States of America B. International Slavery Museum C. William Cooper's Town		New York Collection C. PBS 4/1/14 D. New York Times 3/30/2013 E. The Plate 4/28/14	
Summative Performance Task	Argument	Has the maple sugar production process had an impact on slavery over time? Construct an argument (e.g., detailed outline, exhibit board, poster, essay, website, documentary) that discusses the impact of maple sugar production on slavery using specific claims and relevant evidence from historical sources, while acknowledging competing views.	
	Extension	Create an educational video, website or exhibit board of the argument that responds to the compelling question Has the maple sugar production process had an impact on slavery over time?	
Taking Informed Action	<p>UNDERSTAND Identify and describe a human rights issue that needs to be addressed (e.g., child labor, trafficking, or poverty).</p> <p>ASSESS Create a list of possible actions that involve words. This may include letters, editorials, social media, videos, and protests.</p> <p>ACT Choose one of the options and implement it as an individual, small group, or class project.</p>		

Inquiry Description

This inquiry provides students with an opportunity to explore the production of maple products in New York State. Students will have a chance to explore how the technology from 1700's maple production compares with maple production today. They will look at the labor involved to see if maple production has had an impact on slavery associated with the production of white cane sugar.

The first supporting question asks students to examine production of maple sugar compared with white cane sugar. They will be able to look at the labor and equipment involved with each of the process.

Second supporting question asks students to examine how maple production has been updated. They will be able to revisit the labor involved with the production of maple products today compared with the labor involved in the 1700's.

The third supporting question asks students to think critically about whether the production of maple sugar affected the production of white cane sugar and the slavery involved with its production. They will also look at the current working conditions of sugar plantations in the West Indies to see how it compares to maple production today.

Content Background

Maple Production

Maple syrup is a product produced from the sap of maple trees. Not all varieties of maple trees are used for creating maple syrup. In New York State maple producers predominantly use sugar maples, black maples and occasionally red maples to produce their syrup. Maple sap is collected predominantly in March and April when winter starts to turn into spring. Sap runs during a pattern of freezing during the night and thawing during the day. Maple syrup producers will “tap” trees by drilling a hole in the trunk of the tree. Depending on the sizes and health of the maple, tree it can sustain from 1 to 3 taps. The taps will allow the sap to flow out of the tree where it can be collected. The maple producers then boil the sap to remove the extra water, causing the sap to thicken and create syrup. Syrup with even less water crystallizes into maple sugar. It usually takes about 40 gallons of sap to make 1 gallon of maple syrup. Maple sugar requires even more gallons of sap. Maple syrup and sugar production is a renewable resource. Maple trees are not harmed during the process of collecting the sap, letting maple producers reuse the same trees year after year.

The exact origins of maple sugaring are unknown; we know that the Native Americans introduced Europeans to maple sap and showed settlers which trees to tap. We are unsure if Native Americans boiled down the sap to make maple syrup or maple sugar, or if French explorers and missionaries introduced the technique of turning the sap into sugar. The production of maple sugar was important to early settlers who produced it for their own consumption. It was often used as a substitute for white cane sugar. White cane sugar was expensive and could be hard to find as it had to be imported. Settlers could produce the maple sugar themselves. For most settlers, maple sugar was a staple part of their diet and was as common on tables as salt is today. Due to the cost and availability, white cane sugar would have been used for special celebrations or with visitors.

After the American Revolution there was a push by some to produce enough maple sugar to supply the entire United States. This would keep the United States from relying on imported sugar from the West Indies (Caribbean). Abolitionists supported the idea of replacing white cane sugar with maple sugar as a way of boycotting the Caribbean sugar plantations that relied on slave labor. The labor involved with the production of maple sugar was kept within the community. Families would tap sugar trees and collect the pails of sap bringing them to a sugar shack, often just a kettle over a fire. There they would boil out the water turning the sap into sugar. Maple sap is collected predominantly in March and April when winter starts to turn into spring. Even though it was labor intensive, maple sugaring seasons falls at the end of winter and start of spring, a slow time of year for farmers.

Maple sugar production generally stayed the same until the 1970's when maple producers had to find a way to reduce the labor required to produce maple syrup. They started to perfect tubing systems that brought the sap directly to the evaporator house or sugar shack. Vacuum pumps have been added to the tubing system to increase the flow of sap. Pre-heaters were developed to

help recycle heat that is lost in the steam. Concerns over global warming causing shorter maple seasons are leading to improvements in the technology currently used.

Cane Sugar Production

Cane sugar colonies were established in the West Indies during the 1500 and 1600. Sugar production was the main commodity produced on the islands. Land owners preferred to import provisions, rather than produce them locally. This allowed them to plant more sugar cane. The production of sugar required large amounts of labor as many steps needed to be done by hand. This quickly led to the creation of large sugar plantations that depended on slave labor. The sugar plantations helped create the triangle trade system between Europe, Africa and the Colonies.

Sugar cane was planted by hand with slaves digging holes to plant individual sections of seed cane. The cane fields would need to be weeded and, depending on the weather, sometimes they would also need to be irrigated. Harvesting and the bundling of the sugar cane was also done by hand. Once harvested, slave labor was still required in the process of turning the sugar cane into sugar. The cane needed to be crushed to remove the sap. The sap was then reduced until it was ready to be turned into sugar. The liquid sugar would then be cooled, allowing the sugar to granulate. Once cool, the sugar would be placed into barrels and taken to the purging or curing house. Here the molasses, a byproduct of the sugar process would be drained off. The sugar would spend a period of weeks or months of drying before being shipped to refiners for further purification for sale. The molasses would be distilled into rum.

The increase in technology has helped to keep the labor involved in maple production down. However the sugar cane industry is still labor intensive. Equipment is now used to dig the rows for planting but the seed cane is still planted and harvested by hand in a majority of the world. With current day work conditions on many sugar plantations still being compared to slavery.

Content, Practices, and Literacies

This inquiry has been designed to connect key curricular content with the social studies practices every student should master. Students will have the opportunity to practice Gathering, Using, and Interpreting Evidence from multiple sources including; [William Cooper's Town](#), PBS website, [New York Times](#) news article, [USA Today](#) news article and other selected websites; and practice Comparison and Contextualization through the analysis of different reactions from people in New York State. Additionally, the Taking Informed Action activity emphasizes the power of Civic Participation.

Students' content knowledge and skills are assessed in the inquiry through formative performance tasks, which increase in complexity during the inquiry. These tasks progress from creating a chart comparing and contrasting the process of creating maple sugar to creating cane sugar, to making a list of the production steps and considering areas you would like to improve with technology. Students compare their ideas to what is currently being done to improve maple

syrup production. Have any of those improvements come about due to global warming? Students also write paragraph explaining why or why not the production of maple sugar had an impact on slavery and their thoughts about labor on sugar plantations today. The final formative performance task allows students to initiate their arguments through a structured discussion. The summative performance task asks students to put all of this information together to craft an argument about the various documents provided show or do not show the impact of maple sugar and slavery in New York State.

The New York State P–12 Common Core Learning Standards for English Language Arts & Literacy offer social studies teachers numerous opportunities to integrate literacy goals and skills into their social studies instruction. The Common Core supports the inquiry process through reading rich informational texts, writing evidence-based arguments, speaking and listening in public venues, and using academic vocabulary that complements the pedagogical directions advocated in the New York State K–12 Social Studies Framework. At the end of this inquiry is an explication of how teachers might integrate literacy skills into the content, instruction, and resource decisions they make. The Common Core connections are listed on the last page of this inquiry.

Supporting Question 1

Supporting Question	How did maple production compare with cane sugar production in the 1700's?
Formative Performance Task	Create a chart comparing and contrasting the process of creating maple sugar to creating cane sugar. Make sure you include both equipment and labor.
Featured Sources	A. "Notes on the manufacture of Sugar from the Maple Tree in the United States of America" B. International Slavery Museum C. William Cooper's Town (pgs. 119-120)
Conceptual Understanding	(7.7b) Enslaved African Americans resisted slavery in various ways in the 19th century. The abolitionist movement also worked to raise awareness and generate resistance to the institution of slavery.
Content Specifications	Students will examine the impact of maple sugar production on New York State.
Social Studies Practices	Gathering, Using, and Interpreting Evidence

Supporting Question

White cane sugar was one of the major exports from the new world back to Europe during the colonization of the Americas. Its production was labor-intensive lending support to the triangular trade between Africa, the Americas and Europe. Maple sugar production while similar in some ways to white cane sugar did not require the same amount of labor. A large part of this was due to maple trees sustainability. Producers of maple sugar did not need to plant new trees each season. Sugar cane is destroyed during the process of making white sugar requiring it to be replanted each season.

Formative Performance Task

The formative performance task calls on students to create a chart comparing and contrasting the process of creating maple sugar to creating cane sugar. Make sure you include both equipment and labor. To fully understand the complex process students will analyze these featured sources; "Notes on the manufacture of Sugar from the Maple Tree in the United States of America", William Cooper's Town (pgs. 119-120) and International Slavery Museum entry on Sugar Plantations.

Teachers might read the excerpts aloud for students who require additional reading support while having other students read silently. Students can complete the Comparing and Contrasting Chart individually or with a partner, and the teacher might decide to have a discussion about their answers or collect the chart for feedback later. Students will practice Gathering, Using, and Interpreting Evidence as they complete the Comparing and Contrasting Chart to summarize the excerpts of [William Cooper's Town](#), "Notes on the manufacture of Sugar from the Maple Tree in the United States of America", and International Slavery Museum website entry on Sugar Plantations. The in depth analysis of these resources will allow students

to identify the main idea and supporting details from text passages, website entry and illustrations.

Featured Sources

FEATURED SOURCE A is a document where William Cooper is writing down his ideas to make it easier for a community to produce large amounts of maple sugar. He compares the process to the production of white sugar cane in the West Indies.

FEATURED SOURCE B is a website where students can explore the production of white cane sugar at West Indie plantations.

FEATURED SOURCE C is an exert from Alan Taylor’s book William Cooper’s Town covering the early production of maple sugar in New York State.

Additional Resources

Some students might find it helpful to explore additional resources pertaining to sugar plantations and slavery in the West Indies.

University of Michigan’s website on Sugar in the Atlantic World
<http://clements.umich.edu/exhibits/online/sugarexhibit/sugar06.php>

Supporting Question 1

Featured Source

Source A: “Notes on the manufacture of Sugar from the Maple Tree in the United States of America” ca.1790’s
William Cooper: Cooper Family Papers, Maple Syrup Folder New York State Historical Association Research Library

- “Notes on the manufacture of Sugar from the Maple Tree in the United States of America” ; written by William Cooper, ca. 1790s

The juice of the maple is not [as] rich as the juice of the West India cane. A gallon of the latter in a good season, when the rains are not too frequent, will yield a pound of sugar; but about 4 gallons of the Maple Juice [is] required to produce the like weight; hence a greater quantity of fuel and more intense boiling are necessary to produce the grain [sugar].

In the West Indies, they have 13 copper kettles set in brick work in a right line. This line has five furnaces ... [that fuel] all the kettles, except the middle one, which has a furnace to itself. Within the building, which covers the kettles and ... is called the boiling-house, there is a platform for the attendants to walk on and watch the boiling. The middle kettle is the largest and receives the juice as it comes from the mill. When it is boiled in this kettle for some time, the scum rises (lime added in accordance to the proportion herein mentioned) and is taken off by ladles ... and is afterwards mixed with the molasses that drains from the sugar. This is fermented and makes the best rum, which is called cane juice spirit, preferred to all other distilled spirits. ...

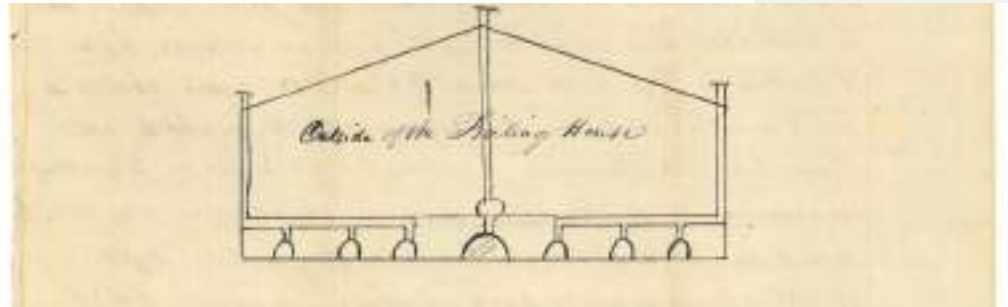
When the scum in the middle kettle begins to part into islets, it should be carefully taken off, and when the liquor remains clear, it is to be emptied by ladles into the two adjoining kettles on each side; the middle kettle is then filled again with fresh juice to be boiled and skimmed as before. ... The juice ... is further boiled and skimmed and emptied into the next two kettles to make way for emptying the middle a second time, and thus it is conveyed from kettle to kettle till it arrives at each end where. Here, it is to be ladled out into coolers to granulate it; these coolers should be of wood, made tight and about six inches deep, the sides spreading toward the top like a tray.

When it has cooled some time and begins to granulate it must be moved gently with a wooden instrument ... and this should be repeated for the whole day and stand all night. In the morning it will be sugar well grained. ...

This process may be used in America if the following mode be pursued. Let a boiling House be erected in the neighborhood of a maple forest upon the foregoing plan but upon a smaller scale, say 7 kettles, the middle one to have a furnace for itself and there on each side with once furnace to each three. Let the process be carried on as nearly in the West India manner as may be. ... The manager will give notice to the neighborhood that he will purchase all the maple juice than can be brought to him in good order. The neighbors may have small casks as such a size that a house with a pack saddle can carry one on each side say from 20 to 30 gallons, these will supply the boiling house which may be increased from time to time as the quantity of juice increases. To prevent impositions, the manager should have some skill in the juice and to be able to tell by the takes whether water has been added to it. But it will not be difficult to fix a standard that will

prevent all possible imposition. A little experience would teach an attentive manager how to manage this matter without a possible mode of cheating him.

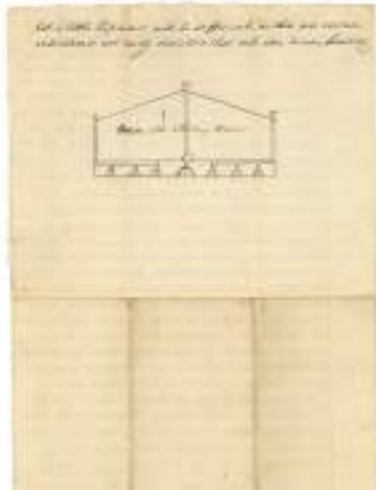
It is difficult to ascertain the quantity of lime necessary to put into the juice to purify it because the West Indians use a very strong lime burnt from marble chips. ... The quantity they put in, in general, is about a gill of lime to 200 gallons of juice when first put into the kettle from the mill. If this quantity is sufficient, they know by the sweetness of the smell which is soon produced. If a raw earthy smell remains, they add a small quantity of lime. ... Nothing but experience can enable a manager to judge these circumstance, but a little experience will be sufficient, as there are certain indications not easily described that will soon become familiar.



1. The first of these is the...
The first of these is the...
The first of these is the...

2. The second of these is the...
The second of these is the...
The second of these is the...

3. The third of these is the...
The third of these is the...
The third of these is the...



Supporting Question 1

Featured Source

Source B: International Slavery Museum

<http://www.liverpoolmuseums.org.uk/ism/slavery/archaeology/caribbean/plantations/index.aspx>

Supporting Question 1

Featured Source

Source C: William Cooper's Town

Alan Taylor, *William Cooper's Town* (1995). Pages 119-120

MAPLE SUGAR

At the same time that Drinker recruited Cooper to sell and settle the Beech Woods, Cooper drew Drinker into the promotion of maple sugar production. In June 1789 Cooper assured Drinker that promoting maple sugar would accelerate the sale and settlement of the Beech Woods; settlers would flock to Drinker's lands if they could obtain cash or store goods by making maple sugar. As the owner of Atsion Ironworks, Drinker had yet another incentive for supporting an enterprise that would demand hundreds of iron kettles. It also pleased Drinker, a Quaker abolitionist, that he could profit from a promotion that promised to strike a blow against slavery. Appealing to a medley of motives that he shared, Cooper assured Drinker, "Land will Likewise Sell for Cash...and wee shall have the Satisfaction of Seeing that we have interrested ourselves in a Good Work." Doing good while earning cash pay was the sweetest promise of a maple sugar to William Cooper and Henry Drinker.¹²

Abundant in the hills of New England, New York, and northern Pennsylvania, the sugar maple (*Acer saccharum*) was a majestic hardwood tree that grew 120 feet tall and 3 feet thick. Yankee settlers had learned from the Indians how to tap each tree with a V-shaped cut of the ax: to insert a hollow spout made of the thin, supple bark of alder or sumac to drain the dripping sap into hardwood troughs; to collect the sap in pails; to boil the juice in iron kettles set over fires to produce a molasses; and to strain and dry the syrup in wooden molds to render a crude, brown sugar. The more thorough settlers built log houses to shelter their kettles from the wind and rain, and they cleared away the underbrush and rival trees in a surrounding grove of sugar maples to create "a Sugar Bush." Sugaring was the work of men and boys during a three- to six-week period at the end of winter and beginning of spring (March and April), when warm days alternate with frosty nights to keep the sap in circulation. A settler's son recalled: "The tapping of the trees, the regular rounds made to empty vessels, the filling of the kettles, the keeping up of the fire, the watching of the process as the transparent sap first changed into syrup, and then into sugar; and all this in the woods, fast budding into life and beauty, formed an annual festival scene whose coming we anticipated with joy."¹³

Initially, Otesgo's Yankee families produced maple sugar in modest quantities strictly for household consumption. It seemed that maple sugar could not compete in urban and foreign markets with the whiter, purer sugar produced from canes grown on slave plantations in the West Indies. But William

Cooper became convinced that maple sugar could be refined and mass-produced to compete in both quality and quantity with cane sugar.¹⁴

Cooper considered maple sugar the ideal commodity for new settlers because its production required little labor and less capital. Simply by tapping existing trees, settlers could produce maple sugar immediately, without clearing the old forest to cultivate new plants. Properly done, tapping neither damaged nor killed a tree, permitting a sustained harvest year after year. Because March was a slack season for farming, the increased production of maple sugar mobilized underemployed labor instead of sacrificing some other enterprise. Because the capital necessary was limited to a kettle, a ladle, a few pails, troughs, and molds, the production could be decentralized among families drawing upon their own labor working their own land. Boys “old enough to carry a pail...or to feed a fire with light fuel” could do most of the work.¹⁵

Supporting Question 2	
Supporting Question	How has maple production been updated over time? Has any of those updates come about due to global warming?
Formative Performance Task	Read “Maple Syrup Production for Beginners.” and look at the Plowline images. Make a list of the production steps and consider areas you would like to improve with technology. Compare your ideas to what is currently being done to improve maple syrup production. Have any of those improvements come about due to global warming?
Featured Sources	<ul style="list-style-type: none"> A. Maple Syrup Production for Beginners B. Plowline: Images of Rural New York Collection C. PBS 4/1/2014 D. New York Times 3/30/2013 E. The Plate 4/28/2014
Conceptual Understanding	(7.7b) Enslaved African Americans resisted slavery in various ways in the 19th century. The abolitionist movement also worked to raise awareness and generate resistance to the institution of slavery.
Content Specifications	Students will examine the impact of maple sugar production on New York State.
Social Studies Practices	Gathering, Using, and Interpreting Evidence

Supporting Question

This supporting question will introduce students to the innovations in the production of maple products over time. They should consider the first two featured sources then think critically about what areas of the process they think could be improved. Then look at the rest of the featured sources to see what innovations have been made in maple production. Students will be able to discover how innovations in technology have assisted maple producers in competing with the effects of global warming.

Formative Performance Task

The formative performance task calls on students to Read “Maple Syrup Production for Beginners” and look at the Plowline: Images of Rural New York Collection. Students will make a list of the production steps for maple syrup and consider areas they would like to improve with technology. Finally the students will compare their ideas to what is currently being done to improve maple syrup production. After their analysis, students will consider “have any of those improvements come about due to the effects of global warming?”

Teachers might read the excerpts aloud for students who require additional reading support while having other students read silently. Students can complete the list of the production steps of maple syrup individually or with a partner, and the teacher might decide to have a discussion about their answers or collect the list for feedback later. Students will practice



Gathering, Using, and Interpreting Evidence as they complete the list of the production steps of maple syrup to summarize their analysis of Maple Sugar For Beginners website, Plowline: Images of Rural New York Collection, [PBS Newshour](#) from 4/1/2014, [NY Times News Article](#) from 3/30/2013 and National Geographic *The Plate* entry from 4/28/2014. The in depth analysis of these resources will allow students to identify the main ideas and supporting details from text passages, website entries and illustrations.

Featured Sources

FEATURED SOURCE A is a guide for people who are interested in producing maple syrup. It is not geared toward the major producer but more towards the backyard farmer. As a result it does not go into detail about the modern technology being used today. It demonstrates how backyard farmers' production in many ways is very similar to the production that was discussed during Supporting Question 1.

FEATURED SOURCE B are images from Plowline: Images of Rural New York. Students can get a glimpse of how technology changed during different steps of the maple production process. This will allow them to think of what areas might still be opened to some improvement.

FEATURED SOURCE C is an article focused on the technology that has improved the way sap is transported to the sugar shack. Students will learn about how computers, smartphones and solar power have all helped to improve maple syrup production.

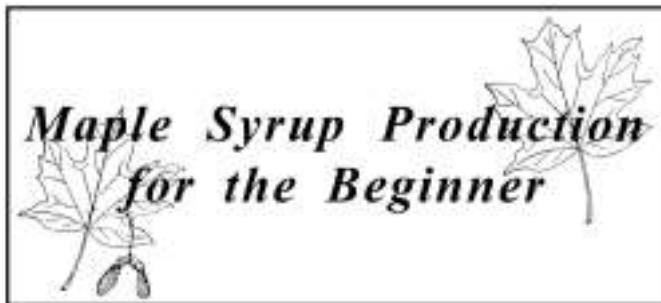
FEATURED SOURCE D is a news article that compares the nostalgic view many people have regarding maple syrup production to the way it is actually produced today.

FEATURED SOURCE E is a news article that goes into how global warming can have an impact on maple sugar production. It covers how vacuum pumps are being used to counteract the shorter sugaring season to increase the amount of sap gathered from the maple trees.

Supporting Question 2

Featured Source

Source A: Maple Syrup Production for Beginners
http://maple.dnr.cornell.edu/pubs/maple_syrup_production.pdf



Anni L. Davenport
School of Forest Resources
The Pennsylvania State University

Lewis J. Staats
Department of Natural Resources
Cornell University
Cornell Cooperative Extension

Maple Syrup Production for the Beginner

Background

Maple syrup is among the oldest natural food products produced in North America. Folklore credits the Native Americans with the discovery of this flavorful natural sweetener. Although modern day commercial operations differ greatly from those of our ancestors, the basic process of converting maple sap to syrup still requires the removal of water from the raw sap to form the finished product. Most novice producers find the experience of producing maple syrup rewarding far beyond the sweet product of their labor. After a few years of experience, many beginners develop a level of enthusiasm that advances them to commercial-size maple production. This leaflet provides instruction for those producing maple syrup for the first time, primarily for home or family use. **Remember**, although you may want to innovate to minimize production costs, maple syrup is a food product and should be produced only with equipment and materials that are approved for food application.

Species to tap

Although several types of maples grow in the Northeast, sugar maple (*Acer saccharum*) is the traditional species tapped for maple syrup production. The sap of the sugar maple generally contains a higher level of sugar than the other maples. Identify sugar maple by its bark, its dark, brownish-colored, sharp buds, and its five-lobed leaves. Red maple (*Acer rubrum*) can be tapped also, but its sap is less sweet and the tree breaks bud before sugar maple. When buds break, or expand in late spring, the sap becomes off flavored and is not desirable for processing. The red maple has red colored, rounded buds and its three-lobed leaf is known for its vivid brilliant red color in autumn. Another species, black maple, varies slightly in the visual characteristics of sugar maple, but otherwise yields sap of similar quality to the sugar maple. Most syrup producers treat the black and sugar maple as one species (Figure 1).

Trees growing along roadsides, in lawns, or in open settings, where their crowns have grown large

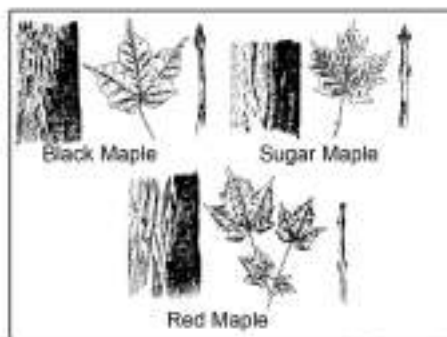


Figure 1

without competition from other trees, generally produce more and sweeter sap than forest-grown trees. Open grown trees are capable of producing one half gallon of syrup in one season (15 to 20 gallons of sap), whereas trees growing in a forest setting generally produce about one quart of syrup (about 10 gallons of sap). In addition to greater sap volume and sweetness, open grown trees generally offer greater accessibility for sap collection.

Equipment

Most of the equipment required for tapping may be available in the home workshop or purchased with minimal investment. Buckets, covers, and spiles (also called spouts) are available from maple equipment dealers and many hardware stores. Other possible sap containers include clean plastic milk jugs or plastic containers with covers. The equipment for processing sap will require greater investment, but will last for many years if maintained properly. Used equipment may be purchased but use judgement and acquire only equipment free of rust and fabricated of food-grade materials. Following is a suggested list of equipment and materials for making maple syrup for home-use.

- carpenter's hand brace or breast drill with 7/16 inch diameter drill bit
- spile (or spout), either metal or plastic for each taphole
- bucket with cover, plastic sap collection bag, or plastic tubs (food grade materials)

- collection or storage containers, such as plastic or metal trash cans (several gallons in capacity and leak-free) for sap storage before processing. Storage capacity of 1 to 2 gallons for each tap (ex. 25 taps = 25 to 50 gallons storage) should be adequate.
- pan with high sides and a heat source for boiling sap. The pan size will vary with the number of taps. Heat source can be wood fire, propane or camp stove. Stainless steel pans fabricated with lead-free solder or welded seams are strongly suggested.
- thermometer calibrated to at least 30 degrees F above the boiling point of water. Kitchen or candy thermometers may be adequate but must be easily readable above 200 degrees F.
- food approved filter for filtering hot finished syrup
- containers for storage of the finished product (canning jars, syrup jugs, etc.)

Procedures

Tapping - Tap maple trees in early spring when daytime temperatures go above freezing while nighttime temperatures fall below freezing. The exact time depends on the elevation and location of your trees and your region. In Pennsylvania and southern regions of New York, first sap flow traditionally takes place in mid to late - February. In northern regions and at higher elevations, the season often begins in early to mid-March. Sap usually flows for 4 to 6 weeks or as long as the freezing nights and warm days continue. If you are uncertain about when to tap, consult with a nearby maple producer or contact your Cooperative Extension Office.

The minimum suggested tree diameter for tapping is 10 inches in diameter (*Note: not circumference*) measured at 4 1/2 feet above ground (see **Other sources of information** for making a diameter measurement stick). A quick and easy way to determine the diameter of the tree is by using a household measuring tape. This will give the circumference of the tree, which can be converted to diameter from Table 1.

Table 1. Guideline for number of taps per tree

Diameter (inches)	Circumference (inches)	Number of taps
10-17 inches	31-53 inches	1
18-24	57-75	2
25 +	79	3

Tapholes should be drilled when temperatures are above freezing to reduce the risk of damage to the tree. Use a 7/16 inch diameter drill (available from hardware stores or maple equipment dealers) in a hand brace or breast drill. Drill into the trunk of the tree in an area that contains sound wood (free of scars, wounds, or older tapholes). If sap will be collected in buckets, a height of two to three feet above ground level allows for easy collection. However, the height can vary depending on preferences, age, and size of the individual tapping the tree. If the tree has been tapped in previous years, locate the new taphole at least 6 inches laterally and 24 inches vertically from the old taphole to insure tapping into good, productive sapwood. For trees with more than one tap, distribute the tapholes around the circumference of the tree. Drill 2 to 2 1/2 inches into the tree at a *slight* upward angle to facilitate flow of sap from the hole (**Figure 2**).

Notice the color of the shavings from the drill as you bore. Shavings should be light or cream colored, indicating live healthy sapwood. Shavings that are dark brown indicate wood undesirable for sap production, and another taphole should be drilled at a new location.



Figure 2

After making sure that the new taphole is free of shavings, insert the spile and seat it with a light hammer. Tap, *not pound*, the spile in the taphole. Seat the spile properly so it can support the bucket. Driving the spile with force can split the bark delaying taphole closure and causing a substantial wound on the tree for many years (**Figure 3**). Do not treat the taphole with disinfectants or other materials at the time of tapping. After removing

spiles from the tapholes at the end of the maple season, do not plug the taphole. Tapping done properly will allow tapholes to close naturally (covered by bark) in about two years and will allow the tree to remain healthy and productive for generations.

Plastic tubing may be used in place of buckets, but its use will not be discussed here. For more information on using maple tubing, consult your maple equipment dealer, local maple producer, or Cooperative Extension Office.



Figure 3

Collection - The volume of sap collected during a flow period will vary from less than a quart to several gallons per tap, depending on the

tree, weather conditions, and duration of the flow or run. The sugar content of sap varies between trees, will fluctuate between runs within a season, and from year to year.

Collect sap daily if possible. It can be filtered through a clean cloth or paper filter to remove debris if desired. Sap can be stored in a clean tank (a 30 gallon storage can works fine) for more



Figure 4

convenient processing. The storage vessel should be placed in the shade to keep the sap as fresh and cool as possible. Because sap is a mixture of sugar and water, it is a perfect medium for bacterial growth. Therefore, it should be collected and processed as quickly as possible to ensure a higher quality product. Clean pails, one for each hand to offer better balance, may be used for collecting sap from the trees for transfer to the collection tank.

When using buckets, make sure each bucket has a cover to keep rain water and other debris from contaminating the fresh sap (Figure 4).

Processing - Usually about 40 gallons of sap are required to produce one gallon of finished syrup. Actually this figure can vary from 20 to 60 gallons

or more depending primarily on sap sugar content. A large amount of water must be evaporated from the sap to produce the finished syrup of 66 to 67 percent sugar. Because the large amount of steam caused by evaporation of the sap could be damaging to interior wall surfaces, the bulk of the boiling should be done outside of the home.

For individuals with 50 or more taps, hobby-size continuous feed evaporators are commercially available. However, most hobbyists boil sap continuously in one pan over an open fire, camp stove, or discarded gas range. Multiple pans (sap is added to the first, concentrated sap from the first pan is added to the next, and so on)



Figure 5

offer more capacity with more efficiency and are often used by producers with more experience. If wood fuel is used, a support (called an "arch") can be constructed with concrete blocks to support the boiling pan and provide a firebox. Dry good quality firewood is most desirable for a hot fire (Figure 5).

Before the fuel is ignited, fill the pan with several inches of sap. Throughout the boiling process, make certain the liquid level is deep enough (about 1 1/2 inches) so the sap will not scorch and damage the pan. As sap is evaporated (liquid level reduced), add more sap. The faster the sap boils, the greater the potential for producing a higher quality product. This "batch" method allows the sap to be processed to a point near the final stage of evaporation. The more concentrated sap can then be finished with more controlled heat on the kitchen range.



Figure 6

Temperature increments are used for illustration.

Sap becomes syrup (66-67 % sugar content) at approximately 7 1/4 degrees F above the boiling point of water (ex. if water boils at 212 degrees F, proper density for syrup would be slightly over 219 degrees F). (Figure 6) Concentrations below 66%

sugar content can sour over time. If boiled above the 67% density of syrup, sugar crystals can form in the bottom of storage containers. The boiling point of water, which varies with elevation and daily changes in barometric pressure, is easily determined by noting the temperature in the raw sap when it is boiling vigorously. Finished syrup will often "age" or create a wide sheet or drip on the edge of a spoon when dipped in and quickly withdrawn above the boiling liquid. To maintain the experience of boiling sap an enjoyable one, **always practice safety.**

Throughout the process, excess foam may be skimmed off the surface of the boiling sap and discarded. Many types of materials, such as butter or vegetable oil, have been used to reduce foaming. However, a commercial defoaming agent available in small containers from maple equipment dealers is recommended. The defoamer should be fresh, and only a drop or two is needed. When used in small quantities, defoamers will evaporate without a noticeable trace in the syrup.

Filtering - When syrup has reached its proper temperature and density, it should be filtered to remove a gritty material called "sugar sand" or "niter" before hot packing in containers. The syrup should be filtered while hot through clean filter material such as wool or orlon available from maple equipment dealers. Syrup should be canned hot (180 degrees F) and stored in a cool dry location or under refrigeration. After a container has been opened for use, it must be refrigerated. Should mold form on syrup that has been stored for several months, simply bring the syrup to near boiling (190 degrees F), remove the mold by skimming, and repack the syrup in a clean container (Figure 7).

The procedure above is intended for home manufacture of maple syrup. If syrup is to be marketed, grading and labeling standards are required for retail sale in most maple producing states. Contact your Cooperative Extension Office or state Department of Agriculture for regulations covering maple products.

Cleanliness and quality control - After a period of warm weather, cloudy sap may appear in buckets or gathering equipment. This is caused by bacterial growth and can have a negative affect on syrup

color and taste. A mixture of 1 part unscented household bleach to 20 parts clean water can be used with a cloth or brush to clean the inside surfaces of sap collection equipment. Follow the cleaning with a triple rinse of clean water to remove any hint of the bleach application. Sap boiling equipment



Figure 7

can be cleaned with hot water, or the product recommended by the equipment manufacturer. Do not use any other cleaning substances in any maple equipment. Household detergents cannot be completely rinsed from equipment and will contaminate sap and syrup with undesirable tastes and odors. When washing sap or syrup filters, use hot water only. At the end of the season after cleaning in the manner described above, store equipment and supplies in a dry place.

Equipment and supplies

Production supplies and materials are available from maple equipment dealers throughout the maple producing regions. Many local hardware stores carry a small line of equipment such as buckets and spiles. Used equipment is often offered for sale in classified sections of local newspapers and agricultural circulars. A maple equipment dealer or distributor nearest you can be located by contacting your local Cooperative Extension Office, maple producers in your area, or through your county, regional, or state maple organization.

Other sources of information

Typing guidelines and determining tree diameter, L.J. Stutz and J.W. Kelley, Dept. of Natural Resources, Cornell University, Ithaca, NY 14853.

North American Maple Syrup Producers Manual, Single copies are available from county, regional, and state maple producer organizations or from: Ohio State University Extension, Publications Office, 385 Kottman Hall, 2021 Coffey Road, Columbus, Ohio 43210-1044. Phone: (614) 292-1697.

Educational videos for maple producers, *Sugarbush Management*, *Maple Sap Production*, *Maple Sap Processing*, produced by Cornell Cooperative Extension. Each video is about 25 minutes and can be ordered from: Cornell University Resource Center, 7 Business & Trade Park, Ithaca, NY 14850. Phone: (607) 255-2090.



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Funding for this publication was provided in part by the New York Maple Producers Association, and the Pennsylvania Ben Franklin Technology Center, Pennsylvania Maple Producers Council, and the Pennsylvania Hardwoods Development Committee and is greatly appreciated.

Spring 1988

You may obtain copies from your local Extension office.

Available on the internet at the DNR web site through the extension page at:

<http://www.dnr.cornell.edu>

The authors acknowledge the following individuals for review of this bulletin: Jim Finley, Bob Hansen, H. Lee Hoar, Marianna Krasny, Paul Curtis, and Peter Smalldge.



Supporting Question 2

Featured Source

Source B: Plowline: Images of Rural New York Collection and T.H. Matteson engraving
<http://plowline.farmersmuseum.org/>

Owner 9/3/15 3:05 PM
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Tapping the maple trees



Drilling to Place a Sap Bucket Spile, 1920 by Vernon E. Duroe
Identifier: F0026.2013(205)a.3 Plowline: Images of Rural New York Collection



Maple Sugaring, 1950 by Dante Tranquille
Identifier: F0001.2010(069)t Plowline: Images of Rural New York Collection

Collecting the sap

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Gathering Sap, 1907 by Unidentified
Identifier: F0001.2015(01) Plowline: Images of Rural New York Collection



Maple Sugaring, 1960 by Dante Tranquille
Identifier: F0001.2010(134)m Plowline: Images of Rural New York Collection

Reducing the sap



Sugaring Off, 1845-1855 by T.H. Matteson
Identifier: N0070.1983 New York State Historical Association



Maple Sugaring, 1950 by Dante Tranquille
Identifier: F0001.2010(069)f Plowline: Images of Rural New York Collection



Maple Sugaring, 1960 by Dante Tranquille
Identifier: F0001.2010(134)qqq Plowline: Images of Rural New York Collection

Supporting Question 1

Featured Source

Source C: Maple syrup producers rely on new technology to fix sticky situations - PBS 4/1/14

<http://www.pbs.org/newshour/run-down/maple-syrup-producers-rely-new-tech-fix-sticky-situations/>

Maple syrup producers rely on new technology to fix sticky situations

BY [Justin Scuietti](#) April 1, 2014 at 3:48 PM EDT

Video by the Associated Press

Maple syrup production has just become a whole lot sweeter for producers looking to minimize problems during their harvest, which only lasts for about one month.

New monitoring systems are allowing maple syrup producers to keep watch on the tubes that draw sap from trees and deliver them to the sugar houses. If a tube is damaged, the technology can immediately detect the affected lines. The process is saving producers from losing valuable sap, typically lost because of damage from animals and falling tree limbs, as well as numerous hours spent searching lines for leaks.

With 40 gallons of sap required to make one gallon of syrup, the less lost, the better.

Solar-powered radio units strapped to trees monitor the pressure in each tube and transmit data to computers and smartphones. With a simple check of whether a particular area is green or red — green signaling all good, red indicating a problem — users can quickly identify problems in specific places. Text messages can even be programmed and sent in case a situation arises.

Supporting Question 2

Featured Source

Source D: High-Tech Means of Production Belies Nostalgic Image of Maple Syrup
- New York Times 3/30/2013

http://www.nytimes.com/2013/03/31/us/maple-syrup-takes-turn-toward-technology.html?_r=1

High-Tech Means of Production Belies Nostalgic Image of Maple Syrup

By JULIA SCOTT MARCH 30, 2013

Photo



Tom Morse, left, and his father, Burr, at work on their maple farm in Vermont. Credit Cheryl Senter for The New York Times

EAST MONTPELIER, Vt. — The rich, sweet tang of sap being boiled into maple syrup greeted tourists at Burr Morse’s sugar shack here this month — along with Mr. Morse, every inch the rural maple farmer in worn baseball cap and syrup-stained jacket, stirring the steaming evaporator with an old-fashioned dipper.

“People want to have a nostalgia trip,” said Mr. Morse, 65, a seventh-generation maple syrup farmer and the patriarch of Morse Farm Maple Sugarworks. “They want to see something natural, like taking sap from a tree.”

Forty years ago, Mr. Morse would snowshoe into the forest with his father to collect sap from galvanized buckets and load them onto a tractor. The farm has not changed much since then, but the winters have. So has the maple syrup ritual itself.

Related Coverage



Scientists say the tapping season — the narrow window of freezing nights and daytime temperatures over 40 degrees needed to convert starch to sugar and get sap flowing — is on average five days shorter than it was 50 years ago. But technology developed over the past decade and improved in recent years offers maple farmers like Mr. Morse a way to offset the effects of climate change with high-tech tactics that are far from natural.

Today, five miles of pressurized blue tubing spider webs down the hillside at Morse Farm, pulling sap from thousands of trees and spitting it into tubs like an immense, inverse IV machine. Modern vacuum pumps are powerful enough to suck the air out of a stainless steel dairy tank and implode it, and they help producers pull in twice as much sap as before.

“You can make it run when nature wouldn’t have it run,” Mr. Morse said.

His greatest secret weapon is a reverse-osmosis machine that concentrates the sap by pulling it through sensitive membranes, greatly increasing the sugar content before it even hits the boiler. The \$8,000 instrument with buttons and dials looks like it belongs in a Jetsons-era laboratory more than in a Vermont sugarhouse. But it saves more fuel and money than every other innovation combined. With it Mr. Morse can process sap into syrup in 30 minutes, something that used to take two hours.

Scientists project that climate change will eventually make New England less suitable for maple forests, but that the trees will continue to thrive in Canada, which even now produces more than 80 percent of the world’s maple syrup.

So an increasing number of maple producers are betting on technology.

The biggest United States maple farmers have expanded their production acreage and are tapping more trees than ever before: the total was 5.5 million taps last year, compared with slightly over 4 million taps 10 years earlier.

As a result, United States maple syrup production hit a new high in 2011. In Vermont, the top-producing state, sap yield per tap has risen over the past decade.

Maple farms are installing equipment that may take 10 years to earn back their cost in syrup sales.

“Technology has greatly increased that ability to make a full-time living,” said Matthew Gordon, the executive director of the Vermont Maple Sugar Makers Association. “It’s not merely the supplemental income it once was.”

But these changes have drawn questions about sustainability. Purists criticize the “techno-syrup” trend, saying it alters syrup’s rustic flavor and sucks the life out of maple trees.

Wrong on both counts, says Timothy Perkins, a plant biologist who directs the Proctor Maple Research Center in Underhill, Vt., the world's foremost academic center for the study of maple and maple syrup.

"It's pretty darn hard to kill a tree by over-tapping it — we've tried," said Dr. Perkins, leading a tour through the center, past long counters with beakers, microscopes and segments of maple, as well as vacuum gauges, spouts and pliers.

The center's scientists, who are employed by the University of Vermont, have altered the face of the industry many times over with inventions to make sugaring more efficient and sanitary, including a special plastic spout that prevents tap holes from drying up or collecting bacteria.

The center's studies have found that as long as maple farmers follow tapping guidelines, maple trees can supply much more sap than was previously thought.

"It's like the tree is a sugar-filled straw, with water and sap that we're sucking right out of the ground," Dr. Perkins said. "The amount we can get out of the soil is unlimited, but the amount of sugar in the tree is limited."

As for taste, a chemical analysis of maple syrup processed with and without reverse osmosis concluded that some flavor compounds had been affected. But when the Proctor center conducted a sensory evaluation with a panel of top maple syrup tasters, no one could tell the difference. Dr. Perkins estimates that as much as 90 percent of the syrup now sold passes through reverse osmosis, adding a new dimension to the official "state flavor" of Vermont.

Dr. Perkins believes that a few more technical improvements could slightly lengthen the maple season, which usually ends in early April. Eventually, though, tubing and vacuums will not be able to overcome the effects of winters with too few extended cold snaps. Weather that is too warm can give late-season sap a "buddy" flavor — a taste that has been compared to sweaty gym socks.

Mr. Morse keeps a couple of "pet buckets" — old-fashioned metal ones — on maple trees to show tourists how it used to be done. He also burns wood chips instead of oil to power the evaporator, his only other concession to the past.

"It keeps our image intact," he said.

A version of this article appears in print on March 31, 2013, on page A12 of the New York edition with the headline: High-Tech Means of Production Belies the Nostalgic Image of Maple Syrup.

Supporting Question 2

Featured Source

Source E: High-Tech Tapping: Making Maple Syrup With Vacuums *The Plate*
4/28/14

<http://theplate.nationalgeographic.com/2014/04/28/technology-tapping-maple-syrup-vacuum/>



Photograph courtesy Wisconsin Department of Natural Resources
April 28, 2014

High-Tech Tapping: Making Maple Syrup With Vacuums

by Mary Beth Albright

At “sugaring-off” dinners, celebratory meals marking the close of maple syrup season, the air and your hair smell like maple syrup and guests leave with a high that has little to do with the amount of sugar consumed.

These dinners are early spring rites of passage, like Easter and Passover, but the religion is food. Sticky sugarmakers exhausted from working round the clock at the whim of the trees, finally relax to a meal. Some of this year’s dinners just ended weeks later than usual because of the

season's delay, with the late cold snap in northeastern North America where the syrup industry is located. (See "Geography in the News: Maple Syrup")

Climate Change Messes With Maple Syrup

This year's Polar Vortex, aka Bipolar Vortex, weather patterns plagued 2014's maple syrup season, with the climate's 70-degree February days followed by Tax-Day snowstorms. (Ironically, April 15 was also the date of this year's Sugar Moon, the first full moon of spring). Maple sap runs only during early spring's usual freeze-thaw cycle of warm days and freezing nights, which lasts for about four weeks. Since this year's weather was less reliable, as weather is increasingly becoming due to climate change, sugarmakers like other farmers must address potentially dwindling yields.

Which is why at the sugaring offs, surely a glass will be raised to technology. Many farmers have started using a vacuum pressure tubing system that sucks sap out of the trees, rather than the traditional method of hanging a galvanized bucket on a tap and waiting for the tree to give it up.

The tubing links the trees together and runs to the sugar house, where the sap is collected and heated in large vats over a fire until it turns into syrup. No more horse-drawn sleighs through the woods to dump small buckets of sap into larger ones. Each tree yields more total sap per year with the new technology, without apparent harm to the tree or changing the flavor of the syrup.

Considering it takes about 43 gallons of sap to make 1 gallon of maple syrup, most farmers find the system a significant improvement. Sugarmakers aren't the first breed of farmer using technology to address global warming challenges, which affect all kinds of agriculture from Napa Valley grapes to Midwestern corn.



Monitoring units like these attach directly to sap lines on trees and measure vacuum pressure. Photograph courtesy of Taptrack

And in a fine example of technology begetting technology, the vacuum-tubing app wasn't far behind. In the days of buckets and taps (you know, five years ago?), farmers would love to know every time a sneaky squirrel upended a pail, leaving precious sap wastefully dripping into the snow. Canadian company Tap Track Technologies offers the equivalent knowledge using sensors, so when a farm uses vacuum technology it can also monitor through an app, receiving alerts when sap isn't flowing from a particular tree, or a leak has sprung in the system. (See "No Nuts, No Problem: Squirrels Harvest Maple Syrup")

Sacrificing Authenticity for Lower Prices

The recent federal farm bill's support of the maple syrup industry doesn't hurt either, with up to \$20 million in state grants to support private landowners to open their trees to tapping. More money into industry development means more entrepreneurship isn't far behind. And these days where there's food entrepreneurship, technology is involved. (See "How Sugar Substitutes Stack Up")

When I recently visited a sugarbush with my 6-year-old son, the farm used a vacuum tubing system to collect sap but left a couple of buckets up for kids to have the old-time experience. As he, wide-eyed, collected sap and ran it to the sugarhouse, I felt a pang of inauthenticity, that we were creating a Norman Rockwell moment rather than participating in the making of an artisanal product that has a sense of place.

I want the iconic version of a pail hanging under a spout, and the constant drip-drip-drip of the sap into the pail. But as we reached for the screen door to leave, the sugarmaker called after me with \$2 – she had mischarged me. The price on my quart of syrup had gone down because their yield was better than years past.

This story is part of National Geographic's special eight-month "Future of Food" series.

Supporting Question 3

Supporting Question	Did maple production in North America have an impact on sugar plantations in the West Indies? Why or why not?
Formative Performance Task	Write a paragraph explaining why or why not the production of maple sugar had an impact on sugar plantations in the West Indies.
Featured Sources	A. William Cooper's Town (pg. 120-126) B. USA Today Article
Conceptual Understanding	(7.7b) Enslaved African Americans resisted slavery in various ways in the 19th century. The abolitionist movement also worked to raise awareness and generate resistance to the institution of slavery.
Content Specifications	Students will examine the impact of maple sugar production on New York State.
Social Studies Practices	Gathering, Using, and Interpreting Evidence

Supporting Question

By looking at the downfall of maple production as a replacement for white cane sugar students will be able to infer the impact that maple sugar had on sugar plantations. They can also consider the working conditions of current sugar plantation workers.

Formative Performance Task

The formative performance task calls on students to write a paragraph explaining the effects maple sugar production had or did not have on sugar plantations in the West Indies.

Teachers might read the excerpts aloud for students who require additional reading support while having other students read silently. Students will write a paragraph explaining why or why not the production of maple sugar had an impact on sugar plantations in the West Indies, and the teacher might decide to have a discussion about their answers or collect the paragraphs for feedback later. Students will practice Gathering, Using, and Interpreting Evidence as they complete their paragraphs to summarize their analysis of William Coopers Town (pgs. 120-126) and the USA Today news article. The in depth analysis of these resources will allow students to identify the main ideas and supporting details from text passages, website entry and illustrations.

Featured Sources

FEATURED SOURCE A is a source that will explain some of the problems that arose with the plan to have maple sugar replace white cane sugar in the United States. Students will learn about how maple sugar became a novelty when producers were unable to deliver on the public's expectations.

FEATURED SOURCE B is a recent newspaper article talking about the current working conditions found on sugar plantations in the Dominican Republic. Students will be able to compare the conditions today to the conditions of slaves from Featured Source B in Supporting Question 1.

Supporting Question 3

Featured Source

Source A: William Cooper's Town

Alan Taylor, *William Cooper's Town* (1995). Pages 120-127

Cooper concluded that maple sugar was the key commodity that would unlock the full economic potential of the northern upcountry to the benefit of consumers, settlers, landlords-and even West Indian slaves. He set out to persuade his countrymen that, if properly promoted and produced, maple sugar could drive imported cane sugar from the American market, that New York and northern Pennsylvania had more than enough sugar maples to satisfy the entire national demand, and that American maple sugar could be exported profitably to Europe. By substituting for the most valuable agricultural commodity imported into the United States, maple sugar would alleviate the new nation's balance of payments deficit, striking a blow for economic independence. Deprived of their markets for cane sugar, West Indian planters would have to shut down their plantations and liberate their slaves. Produced by free families "without exercising the lash of cruelty on our fellow creatures," American sugar would advance the day "when the minds of men are become so liberal as to view liberty in its true light-when slavery shall be done away." The money that was flowing into the coffers of importers and the West Indian planters would instead pass into the pockets of American Farmers, enhancing their standard of living. Become prosperous, farmers could readily pay their debts to landlords. Eager to share in the new prosperity, migrants would flock west to settle in the New York hills, paying increased prices for lands covered with sugar maples."¹⁶

But there was no time to waste, for settlers were "wantonly and foolishly destroying" the sugar maples by the thousands as they cleared the forest. Because maple trees were especially valuable for firewood or potash, they quickly attracted the interest and the axes of new settlers. Cooper hoped "to rescue from destruction these trees; these diamonds of America; these gifts of Heaven, which never created anything in vain. Thousands of them are daily destroyed...I stand alone for their protection, and plainly perceive that our country will soon be deprived of them; but knowing their value, I now plead their cause." In *The Pioneers* James Fenimore Cooper paraphrased his father's rhetoric, placed in the mouth of Judge Marmaduke Temple, who condemns the "practice, which devotes these jewels of the forest, these precious gifts of nature, these mines of comfort and wealth, o the common use of a fireplace." Temple calls the maple trees "jewels" as Cooper called them "diamonds": both evocations of the longing to find hidden treasures lurking in their lands.¹⁷

Cooper sought to conserve the sugar maples not out of any romantic esthetic or any ecological sensibility but from a conviction that their long term value as sugar producers vastly outweighed their immediate value as potash or firewood. He did not mean to stop all deforestation, merely to preserve the groves where sugar maples were most numerous: "There is land enough where they stand thin, for the purpose of plowing, sowing, mowing, and pasture." Cooper was very much like Marmaduke Temple, who explains, "It is not as ornaments that I value the noble trees of this country; it is for their usefulness."¹⁸

Cooper faced a hard sell to change both consumers' tastes and producers' habits. First, he had to overcome consumers' entrenched preference for the whiter, purer cane sugar, widely considered a token of good and fashionable taste. Second, he had to persuade the common farmer to invest the additional time, effort, and equipment to make surplus sugar for the market. Third, he had to induce that farmer to produce a finer sugar that met the expectations of urban consumers. By taking greater pains to keep falling water, blowing dirt, and thirsty cattle out of their troughs, pails, kettles, and molds, the settlers could render their sugar "a Suitable Article among those of a Delicate Taste." Fourth, he had to establish a distribution network to link the sugar producers in the hills of New York to the seaport markets. "I know that the idea has an extravagant appearance, and will be thought by most people an enthusiastic, fanciful and visionary plan; but let reason usurp the throne of prejudice," Cooper pleaded.¹⁹

To prove maple sugar's commercial potential, Cooper proposed to run and publicize a pilot program on his patent. Otsego offered the perfect combination of industrious but needy Yankees and maple-abundant land. Cooper assured Henry Drinker, "I therefore find much Depends on my Exertions" on the Otsego Patent, "a New thick seteled County full of interprising People whose wants of Many articles of Life together with...my influence (Excuse me Henry for Saying it for I think I can speak to thee of facts without Blushing) will Procure a great quantity of well made Sugar wich I shall bring Every Pound to your City." Because men would only believe what they could see, Cooper meant to evangelize for maple sugar by "the repeated testimony of ocular demonstration...laid before the eye of the public."²⁰

In June of 1789 Cooper reached an understanding with Drinker to produce maple sugar in Otsego for the Philadelphia market. Drinker agreed to make, ship, and consign to Cooper on credit 300 iron sugar kettles, each with handles and a capacity of 15 gallons, at a price of 18 shillings apiece. Cooper went to work touring Otsego and the other Montgomery County settlements, proselytizing for men to take the kettles on credit and produce sugar in payment. He also constructed a store and a warehouse in Cooperstown to dole out the kettles and take in the sugar. That summer and fall he wrote numerous letters and newspaper blurbs "to Spread the flame and be Politically advantageous; and indeed too many truths cannot be Said on this Subject in order to make it more *Popular*" and thereby "set this Valluable Tree in that Conspicuous Point of View as to Prevent the Divestation that Dayly taking Place among them." In October, Cooper gleefully reported to Drinker that "the number of kettles talked of by us [is] far short of the Applications made to me by the inhabitants of the Country." In mid-November, Drinker shipped the kettles, and they reached Albany onboard the sloop *Nancy*. From Albany teamsters hauled the kettles on sleighs over the snow, westward up the Mohawk and across the hills to Otsego Lake and Cooperstown.²¹

While Cooper planned production in Otsego, Drinker drummed up support in Philadelphia. Tench Coxe and Benjamin Rush helped by publishing pamphlets and newspaper blurbs extolling the delights, benefits and prospects of maple sugar. Dr. Rush portrayed sugar, especially maple sugar as an elixir and dismissed critics: "It has been said, that sugar injures the teeth, but this opinion now has so few advocates, that it does not deserve a serious refutation." Drinker, Coxe, and Rush prepared a guaranteed market and price in Philadelphia for maple sugar by enlisting other leading Philadelphians

into a subscription. They promised to pay 7 pence per pound for the maple sugar that Cooper would, they promised, deliver in the spring. Interest and idealism combined to draw in the subscribers, described by Coxe as “the friends of the Slaves & of Manufactures Landholders and public spirit people.” A dozen were land speculators who had hired William Cooper as their agent for tracts in the Beech Woods. The subscribers also included the Quaker leaders of the Pennsylvania Society for the Abolition of Negro Slavery. But the promoters failed to move the unsentimental merchant Robert Morris, who replied to Drinker’s solicitation: “I wish the Plan of using maple Sugar in the City may take, but the success will depend upon the quality and Price. Agreements & subscriptions don’t hold long unless supported by convenience or interest.” His caveat prophesied the difficulties that would soon follow. As completed on September 3, 1789, the list named seventy-four men who subscribed for a total of 15,800 pounds. Henry Drinker led the way, promising to buy 2,000 pounds, but most subscribers pledged to take only 100 or 200 pounds.²²

In Cooperstown on January 21, 1790, Cooper began to sell sugar kettles on credit for 1.12.0 pounds each. The settlers could pay for their kettles with sugar in the spring. At the price of 6 pence per pound, 64 pounds of maple sugar would pay for a kettle. By mid-March he had sold all the kettles supplied by Drinker. The 166 individuals who bought kettles in 1790 represented over half of his store’s customers (166 of 315 = 53 percent). Matching names in the store book with the heads of household on the 1790 federal census reveals that at least a third of the settlers within Otsego Township-and over half of those dwelling on Cooper’s patent, nearest the store-obtained a sugar kettle. Cooper entrusted sugar kettles on credit to almost anyone who applied, no matter how poor. In the maple sugar promotion, as in his 1786 land sales, Cooper was the common settler’s friend.²³

In February the extraordinary demand for sugar kettles fed Cooper’s boundless optimism. Throughout Otsego he detected “a Spirit of Preparation for the Sugar Buisness-so much so that not a Doubt id Left with me of the amount being Prodigious.” He projected a harvest of 50 tons. Nothing, it seemed, could go wrong: “The Common invention of man Leaves many Crises that the Oposing winds Blow through, whereas the Present Plan (Let me Say it with thankfulness) Seems to Stand in the Clear Sunshine.”²⁴

However, the weather failed to cooperate with Cooper’s plans, as an unusually frigid March and early April delayed the season. By the end of the truncated season in early May, Cooper had received, weighed, and packed into hogshead barrels about 20,000 pounds of sugar-fifth of the amount that he had predicted in February. Only about two-fifths of the settlers (64 of 166) delivered enough sugar to pay for their kettles in full. Indeed, almost a third of the kettle buyers (49 of 166) produced no marketable sugar whatsoever. On average, each producer brought 80 pounds of sugar: far below the 500-pound target set by Cooper in October. In late May, Cooper informed Drinker: “The Season for Sugar hath ben the Poorest that hath ben known for this 20 years. People who made 1000 lb Last year, has not this with Double the exertions and Convenancys made 300.”²⁵

None of the sugar collected would benefit Cooper and his associates unless he could get it to Philadelphia over bad roads and rough rivers. In July he packed the sugar into hogshead casks, which, when filled, averaged 535 pounds. Teamsters loaded the hogsheads onto ox-drawn carts bound

northward over the hills to the Mohawk and then eastward to Albany: “a great work attended with much Expence and Loss by raines” that clogged the roads with mud and drenched the hogsheads. Ominously, Cooper informed Drinker that the rain had penetrated at least eight hogsheads, perhaps damaging the sugar within.²⁶

Prospects brightened once the hogsheads reached the Hudson and their progress become a triumphal procession well publicized in the newspapers. “The Sight makes Albany stare,” Cooper boasted. He scored a public relations coup by persuading Albany’s preeminent grandee, the manor lord Stephen Van Rensselaer, to host a maple sugar and tea party at his Manor House for “a large company of ladies and gentleman.” Understanding the importance of creating an aura of celebrity and fashion, Cooper published their statement that his maple sugar was “superior in flavor to the best muscavado sugar.” On August 14 a sloop laden with the maple sugar set sail down the Hudson for New York City and Philadelphia to the applause of newspaper editors primed by Cooper’s letters.²⁷

Traveling overland from New York City via Burlington, Cooper became a celebrity among the gentlemen of the urban Northeast—who were fascinated with the commercial prospects and benevolent implications of maple sugar. In 1791 the New York Society for the Promotion of Agriculture, Arts, and Manufactures invited Cooper to deliver an address at City Hall in New York. Presided over by the great manor lord (and chancellor of New York’s court of equity) Robert R. Livingston, Jr., the society was a concave of the state’s leaders. After the speech Cooper boasted that he had addressed “a full meeting at the City Hall in [New] York,” that the society had published his remarks, and that they had elected him a member—three reassuring proofs that he had been accepted by the gentility who governed the Republic. He assured Benjamin Rush that the speech had been “so Clear, yea had I not ben Preparing it my self I should not hesitate to say it must force Convince into every mind...and I have no Pride in inclosing it to thee but as their may be something worthy of attending to in it.” Cooper basked in the attention of renowned men like Livingston and Rush. Because of maple sugar he could play to the audience whose approval he so earnestly wanted and needed to validate his recent ascent from poverty and obscurity. Whatever its failure as a marketable commodity, maple sugar opened important doors for William Cooper.²⁹

Through surrogates Cooper even reached the attention of the preeminent American gentleman: President George Washington. In the spring of 1791, Cooper sent his associate Arthur Noble to Philadelphia bearing samples of maple rum and maple sugar. Benjamin Rush arranged for Noble to meet his friend Thomas Jefferson, the secretary of state. The Anglophobic Jefferson took a keen interest in the experiment as potentially liberating the United States from its reliance on the British West Indies for sugar and molasses. “He is as Sanguine as you or I about Maple Sugar. He thinks in a few years we shall be able to supply half the World,” Noble left his samples with Rush for formal delivery to the president in August. Washington accepted, wrote a gracious reply, and emulated his secretary of state by planting a few maple trees at Mount Vernon. Newspaper publication of Washington’s reply served to promote maple sugar and to link Cooper’s name with the president.³⁰

Cooper's fame even extended across the Atlantic as maple sugar became a sensation in the circles of enlightened gentlemen committed to linking scientific progress with social reform. Drinker sent promotional pamphlets and samples of Cooper's sugar to prominent English Quakers and abolition-minded members of Parliament, including William Wilberforce. Jacques Pierre Brissot de Warville, president of the French society for emancipating slaves, also took an avid interest in the activities of Drinker and Cooper. Such was the European demand for samples that in May 1791, Drinker begged Cooper for 500 pounds "of the very best quality thy stock will afford. If any Man in America or indeed elsewhere, has a right to a preference in this matter, surely it is H[enry] D[rinker]." The best market for maple sugar was as samples sent to curious and benevolent foreigners; maple sugar was most valuable as a fashionable curio associated with enlightened reform. The samples served as so many calling cards, introducing William Cooper's name to the gentlemen of London, Paris and Amsterdam.³¹

A highly personal crusade, the maple sugar promotion united and harmonized William Cooper's diverse ambitions: to become at once rich, respected, and beloved. He sought to enjoy private wealth, the accepting approval of great men, and the loving gratitude of common folk. By creating the maple sugar market, Cooper hoped to complete his ascent, becoming the father of his settlers, the benefactor of the West Indian slaves, the peer of New York's gentry, a favorite of the eminent Philadelphians and the champion of enlightened Europeans. In long, chatty letters Cooper took pains to impress and flatter his patrons. He informed Drinker that teaching the settlers to produce sugar of marketable quality "was a Difficulty that few besides W[illiam] C[ooper] would have attempted. The People are now Passified with the alteration and bring it in Rapidly. Only think what a Pleasure it is to me to give thee this information." Eager to please, he informed Drinker, "We never weigh off a Parcel of Sugar but we Speak of thee, Dr. Rush, T[ench] Coxe and other friends to our Experiment." He plotted flamboyant promotions and dramatic presentations that would, in the service of maple sugar, bring and keep his name before the public eye. In particular, Cooper carefully planned his triumphal appearance in Philadelphia with a sloop load of maple sugar to receive the applause of his illustrious patrons. He intended "once more [to] see my friends in Philadelphia with Boldness, having the Evidence of my former Declarations with me to Produce." Cooper envisioned the success of maple sugar as a personal triumph; those "who are now opposed to the business, will look around and reflect on the havock universally made, and say, I now join in opinion with WILLIAM COOPER." However, that raw aggressive personalism—as well as the flamboyant misspellings, malapropisms, and mixed metaphors of his speech and his writing—only marked Cooper's social awkwardness, for a polished gentleman more carefully masked his ego and his insecurities.³²

DISENCHANTMENT

However, in Philadelphia the public euphoria gave way to private disenchantment as Edward Pennington, sugar refiner engaged by Henry Drinker, opened the celebrated hogsheads and discovered the damage inflicted by the summer rains. Water had penetrated all the hogsheads, rendering most of the maple sugar too dark and moist to have any market value: "It may do to look at and afterwards be

applied to some use in thy Family." At great expense and trouble, Drinker had bought a very bulky novelty. None of the Philadelphia refiners would accept the maple sugar he had obtained from Cooper.³³

Supporting Question 3

Featured Source

Source B: USA Today Article – *Labor Dept. finds bitterness in sugar workers' lives*

<http://www.usatoday.com/story/news/nation/2013/10/03/sugar-workers-human-labor-rights/2919687/>

Labor Dept. finds bitterness in sugar workers' lives

Mark Curnutte, The Cincinnati Enquirer 10:46 p.m. EDT October 3, 2013

A recent agency report finds evidence of poor working conditions and rights violations among migrant sugar cane cutters in the Dominican Republic.



(Photo: Gannett/Mark Curnutte, The Cincinnati Enquirer)

SAN PEDRO DE MACORIS, Dominican Republic — With no hope of finding work in his native Haiti, like many before him and since, Lucner Pierre migrated in 1978 to look for a job in the Dominican Republic's sugar industry.

Now 59, he has for most of the past 35 years manually cut sugar cane with a machete, dangerous field work which damaged his sight and turned his skin the creased texture of animal hide. He receives only minimal medical care and lives in company housing, sharing a bug-infested room with seven other men during harvest season, earning in 12 hours, he said, "just enough to eat."

"I can't send money home," Pierre said. "I can't go home."

Situations similar to Pierre's are a reason that a U.S. government report released last week validates public submissions made by human rights activists about deplorable living and working conditions for undocumented Haitian migrant workers and other poor laborers in the Dominican Republic's sugar cane fields.

The U.S. Department of Labor's Office of Trade and Labor Affairs "found evidence of apparent and potential violations" of labor law and workers' rights called for in the free trade agreement signed in 2004 by the United States and the Dominican Republic. The labor department also announced last Friday the commitment of another \$10 million over the next four years, bringing the amount invested since 1998 to \$16 million, to reduce child labor, expand labor rights and improve working conditions.

"Working together with the Dominican government, we look forward to making a real difference in these workers' lives," U.S. Labor Secretary Thomas Perez said in the report.

Among violations cited: poor working conditions related to minimum wage; 12-hour work days; seven-day work weeks; and occupational safety and health concerns such as the lack of potable water, absence of a minimum work age and indications of forced labor, including unlawful overtime performed under threat of deportation.

The labor department, which published the report on its website last week, responded to complaints first brought in December 2011 by Catholic priest and worker advocate Christopher Hartley. His parish included dozens of cane field villages, known as bateyes, where Hartley served for nine years as a church pastor before his 2006 removal by the local bishop.

"Fair trade, the fight against modern-day slavery and standing up for our commitments regarding fundamental human rights and freedoms are all issues of deep concern to the American public," Hartley wrote in an email from Ethiopia, where he has worked since 2007.

The United States imports about 220,000 tons of sugar annually from the Dominican Republic, a relatively small amount compared to other countries and the single-nation high of 1.9 million tons imported in 2012 from Mexico, according to the U.S. Department of Agriculture. Yet the Dominican Republic's export quota to the United States is greater than the five other nations – Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua – that are part of the Dominican Republic-Central America Free Trade Agreement (CAFTA-DR).

The Dominican government, prior to publication of the labor department's report, responded to specific questions about Hartley's submissions by calling them "allegations that are far removed from the actual status of workers in the agriculture sector and the protections afforded their rights. ... The unsubstantiated allegations presented by Father Hartley are the unfortunate consequence of a personal agenda."

Officials at the Dominican Republic's embassy in Washington, D.C., did not respond to repeated requests for comment after the report's release. However, a leading U.S. importer of sugar did respond Thursday to the report's findings.

"Our company is committed to ethical sourcing, and we are spending time reviewing the Department of Labor's findings concerning the Dominican Republic," Brian O'Malley, president and chief executive of Domino Foods, Inc., said Thursday in a statement released by the Florida-based company.



Domino Foods is part of ASR Group, the world's largest sugar refining company, which imports sugar from many countries, including the Dominican Republic. Domino Foods is the sales and marketing company that sells sugar in the United States under the brand names Domino, C&H and Florida Crystals.

O'Malley said it is the company's understanding that the report does not claim violations by the Dominican Republic of labor regulations in the CAFTA-DR.

"Working conditions and workers' safety are of paramount importance to us," he said, "so we are encouraged by the fact that although the Dominican sugar industry disputes the report's finding, it has said it will consult with its organized labor unions and the Dominican government to develop an effective response to any genuine issues reflected in the report, such as assuring that all wages, hours and benefits are accurately documented for follow-up analysis by the U.S. government."

Still, said Hartley – who remains widely vilified in the Dominican Republic – the labor department report is proof of migrant worker exploitation there and should serve as a reminder to Americans that the workers' plight is not a distant phenomenon.

"I think most Americans would be ashamed to know at what price they put sugar in their coffee every morning," he said. Sugar workers "are real people, real children, with hopes and dreams of a better future and of a dignified existence."

The land of opportunity?

About 460,000 expatriated Haitians live in the Dominican Republic, according to the 2013 Dominican National Survey of Immigrants, released in July.

About half of Haitians in the Dominican Republic live largely in isolation in bateyes. They are clumps of company housing or free-standing huts in the middle of cane fields, most often lacking adequate sanitation, electricity, potable water, schools and medical care. Homes surround a crude town square in which the only businesses are lottery booths and privately owned corner stores – known as colmados – stocked with liquor and food stuffs such as rice, at which workers and their families run up mounting debts, according to the new Labor Department report.

The healthiest and strongest workers can cut 3 to 4 tonnallata – about 2,200 pounds each – in a 12-hour shift, usually 4 a.m. to 4 p.m. A ticketer labels the load. A cutter can earn 120 pesos per tonnallata, currently about \$2.82 U.S. So in 12 hours of hard labor, the most productive worker will earn between \$11 and \$12, advocates say.

Even this process, worker advocates say, has been changed to benefit sugar companies and take from workers. Sugar fields are dotted with dozens of abandoned and rusting weigh stations, where wagons filled with cut cane would be hauled and the cane weighed at the end of the day. Now cane is weighed privately -- out of sight of the worker who cut it -- and first allowed to dry overnight, which makes the cane lighter and less costly.

"What is clear is that the worker has no guarantee that he will be paid fully for his work," said Maria Victoria Mendez Castro, an attorney in San Pedro de Macoris and associate of Hartley's.

Yet compared to Haiti, where adult unemployment estimates range from 67 percent to 75 percent, something is better than nothing.

Johnny Young, 28, left Haiti four years ago. On a mid-July day he cut stalks and loaded them onto a wagon with Pierre Johnson, a man born of Haitian parents in the Dominican Republic. He has worked since he was 17.

"I am sorry I came. I am sorry I left my country," Young said. "I left looking for work and a life. I found my death."

Johnson is among the estimated 2.5 million of the 8.9 million people living in the Dominican Republic who do not have a birth certificate. Those without one are either Haitian by birth or the second- or third-generation children of at least one Haitian parent.

"I would like to learn to drive a truck some day," said Johnson, 24, who has not attended school and cannot read or write. "I don't have any paper."

In the Dominican Republic, the prized paper is the cedula, the state ID card that essentially is a driver's license that also allows people go to school, register their children for school and get medical care and insurance.

"I am not free on the streets, I can not go to school and can not work, I can not marry legally or travel," said Isidro Belique, 24, who lives on the batey Canutillo near the town of Quisqueya. "Inside my own country, I cannot move. Civilly, I am dead."



Undocumented Haitian immigrants and other poor workers in the Dominican Republic's sugar cane industry often live in bateyes, rough clusters of company-owned housing that lack adequate sanitation, potable water, electricity and schools. (Photo: Gannett/Mark Curnutte, The Cincinnati Enquirer)

Worker advocates focus on pension, documents

Native-born Haitians and their children are at the bottom of a racial caste system in the Dominican Republic, where the standard citizen is considered a mulatto. Dislike and distrust between Haitians and Dominicans run deep in these former French and Spanish colonies on the shared island of Hispaniola.

The Dominican government defends its policy not to grant rights to children of Haitian parents born on its soil, children who are nonetheless "fully entitled to Haitian citizenship and as such ought not to be considered stateless," a government spokesman said on condition of anonymity. Half of children born in Dominican hospitals in border regions are to Haitian mothers and are a major reason that 15 percent of the Dominican national health budget goes to treating the migrant population, the government says.

Yet the Dominican and Haitian governments are working together with religious organizations to help children born of a Haitian parent in the Dominican Republic receive a Haitian birth certificate and passport. The Scalabrinian Association, a Catholic order dedicated to helping migrants and refugees, receives money from the U.N. High Commissioner for Refugees and the European Union to work with illiterate workers to fill out forms that are processed by the Haitian consular office. In 2012, 2,000 Haitians received documentation, a number that could reach 5,000 this year, said Idalina Bordignon, a Brazilian nun and the group's director in the Dominican Republic.

Cane cutters are most concerned with money – what they earn and the government pension they are required to pay into at a rate of 2 percent of their earnings. Most often, sugar companies do not contribute their 7 percent portion of the pension for sugar workers, said Bordignon and other worker advocates.

"On the bateyes, with these conditions, what do the workers have?" Bordignon said. "All the worker owns is his work."

Francisco Roberto Luisa, 69, left Haiti in 1964 and cut cane until 2006, when poor eyesight forced him to retire. The injury occurred when he reached down into the field and a sharp cane stalk pierced his left eye.

"I had headaches, and the company took me to a clinic," Luisa said. "They gave me glasses. It doesn't help."

He stopped working and moved off the batey into a small house with other retired or disabled workers. Luisa said he plants a small garden to feed himself.

"I am still waiting for my pension," he said.

Leon La Fontain, 79, receives a pension of 5000 Dominican pesos a month, or about \$125 U.S. Born in the Dominican Republic to Haitian parents, he cut cane for 57 years. He supplements his income by cleaning and doing maintenance work in a medical clinic run by a foreign religious organization.

"I know I am very fortunate," Fontain said. "It was the intervention of God."

Labor department: Allow workers to organize

The U.S. Department of Labor, in its recent report, makes a dozen recommendations to the Dominican government to improve the enforcement of its labor laws and to better identify and address labor and human rights violations that affect sugar workers. The labor department will review the status of recommendations in six months and again one year from now.

Even with the victory that the labor department report represents, the majority of Haitians or Haitian-Dominicans living and working in the Dominican Republic don't have documents and won't live to see their pension.

Lucner Pierre, achingly thin except for his muscled arms and hands, says he doubts he will receive a pension or documents in his lifetime.

Inside his darkened room, he described how he uses his machete to cut sugar cane and his hoe to remove weeds. He stopped speaking when he heard children play outside in a poured concrete well. Then they ran off to kick a homemade soccer ball made of knotted rags across a dirt yard. Maybe life will be better for them.

Pierre walked to the wall opposite the window, where he pointed to count the bloody, smeared hash marks of bloated bed bugs he had killed with his fingers.

"During the day, you lose blood working in the sugar fields," said Pierre, his eyes and voice both flat and without emotion. "And at night, the bed bugs come and get what's left of you."

Mark Curnutte, who covers social issues for The Cincinnati Enquirer, traveled for two weeks in July to Haiti and the Dominican Republic on an international social justice reporting grant.