

 University of  
Kentucky®

Cooperative Extension Service  
College of Agriculture, Food and Environment  
**Forestry Extension**



# Kentucky Forestry Economic Contribution Report 2016





# Table of Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>Overall Contribution.....</b>	<b>2</b>
<b>Forest and Wood Industries.....</b>	<b>3</b>
<b>Timber Output and Prices.....</b>	<b>4</b>
<b>Exports.....</b>	<b>5</b>
<b>Harvested Acre Value.....</b>	<b>5</b>

## ***About the Data***

A variety of sources were used to develop this report including IMPLAN data from 2015 used to estimate both direct and total 2016 economic contributions. Direct economic contribution refers to the economic activity directly associated with an industry sector. Total economic contribution refers to the complete economic activity associated with an industry sector and includes direct, indirect, and induced effects. The 2015 IMPLAN data was adjusted to provide 2016 estimates based on annual employment figures from the Kentucky Forest Products Industry Directory maintained by the University of Kentucky, Department of Forestry Extension and the Kentucky Division of Forestry (KDF). The availability of current employment data in the directory also allowed adjustments of other sources of information such as the USDA Forest Service's Timber Product Output data allowing reasonable estimates of current year's outputs. Data from KDF through its Delivered Log and Product Prices is also essential for this report as is the Forest Inventory Analysis provided jointly by KDF and the USDA Forest Service. Data from USDA NASS Census of Agriculture, RISI, the Kentucky Master Logger Program, and Kentucky Forest Industries Association members also provided data used in this report.

## **List of Figures and Tables:**

Figure 1. Annual Direct and Total Economic Contribution of the Kentucky Forest Industry (2012-2016)...pg. 2

Figure 2. Kentucky Wood Industries and Master Logger Distribution 2016...pg. 3

Figure 3. Direct Economic Contribution by Kentucky Forestry Sub-Sectors in Millions...pg. 3

Figure 4. Direct Employment by Kentucky Forestry Sub-Sectors...pg. 3

Figure 5. Delivered Tie Logs Prices in Kentucky 2011-2016 by Quarter (\$/MBF)...pg. 4

Figure 6. Delivered Stave Logs Prices in Kentucky 2008-2016 by Quarter (\$/MBF)...pg. 4

Figure 7. 2016 Economic Contribution of One Acre of Harvested Timber in Kentucky...pg. 5

Table 1. Delivered Grade 1 Sawlog Prices for Major Species in Kentucky (\$/MBF)...pg. 4

Table 2. Top 5 Kentucky Wood, Paper, and Pulp Exports in 2016 in Millions...pg. 5

*All photos courtesy: Tom Barnes, Billy Thomas, Renee' Williams, and Chris Evans, University of Illinois, Bugwood.org*



# Kentucky Forestry Economic Contribution Report 2016

## Authors\*

Jeff Stringer, Billy Thomas, Bobby Ammerman, Thomas Ochuodho, Alison Davis

## Executive Summary

Forests play a pivotal role in Kentucky's economy and in the lives of the citizens of our state. Forests are the single most dominant land type, covering nearly one-half of the state, providing a significant range of both economic and non-economic benefits to the Commonwealth. The majority of the economic contribution is derived from the harvesting of timber and processing of the wood resource. Analysis of Kentucky's forest and wood industries in 2016 indicated an estimated direct economic contribution of \$9 billion (down one percent from 2015). These industries employed over 27,700 individuals. Total economic contributions in 2016 were estimated to be \$14.4 billion with a total employment of 60,225. The 2016 forest industry contributions were mixed compared to the previous year with the biggest declines coming from paper converters and the pulp and paper sub-sector, the latter can be traced to the closing of the Verso mill in western Kentucky. The economic contribution was generated from timber resources in all 120 counties of the Commonwealth, harvested by over 1,200 logging firms and processed at 722 facilities located in 110 counties. These industries include sawmills, pulp and paper mills, and a wide variety of secondary producers such as cabinet, barrel, and flooring manufacturers. The 2016 sawlog production estimate of 746 million board feet secures Kentucky's place as one of the leading producers of hardwood forest products in the U.S. Analysis shows that each acre of woodland harvested in 2016 was responsible for producing a direct contribution of \$21,763. Delivered log prices remained relatively stable in 2016 with strong prices for stave logs used for barrel production which continues a recent trend. This report highlights the economic contribution of the Kentucky forestry sector in both rural and urban Kentucky in 2016.

## Acknowledgments

The authors thank Kentucky Division of Forestry (KDF) personnel, particularly Stewart West, for providing necessary and invaluable information to this report; Chris Oswalt with USDA Forest Service's FIA unit in Knoxville; Mark Schuster, KDF coordinator of the Kentucky Master Logger Program; members of the Kentucky Forest Industries Association; and Terrell Baker with the University of Kentucky Department of Forestry. Special thanks go to Reneé Williams, Information Specialist with the University of Kentucky, Department of Forestry Extension for publication graphics and layout.

\*Extension Professor of Hardwood Silviculture and Forest Operations; Extension Associate for Family Forest Education; and Extension Associate for Secondary Forest Industry, University of Kentucky, Department of Forestry Extension; and Assistant Professor, University of Kentucky, Department of Forestry; and Extension Professor, University of Kentucky, Department of Agricultural Economics, respectively.

# Overall Contribution



**Direct: \$9 billion**  
**Total: \$14.4 billion**

In 2016, the forest industry was estimated to have provided \$9 billion in direct economic contributions, a decrease of one percent from 2015 (Figure 1). The total economic contribution of the Forestry Sector that includes direct, indirect, and induced contributions was estimated to be \$14.4 billion. Direct employment in the forestry sector was relatively stable with a small decrease in 2016 to 27,740. This employment is the equivalent of 26,668 full-time employees. The sector generated a total employment of 60,225 with an earned income of approximately \$1.47 billion.

**Direct Employment: 27,740**

**Direct Full-Time Equivalent Employment: 26,668**

**Total Employment: 60,225**

**Earned Income: \$1.47 billion**

The number of facilities increased in 2016 to 722, as nine new facilities came online. There are now forest industries located in 110 of Kentucky's 120 counties. Despite a very small downturn in 2016, the overall forestry sector in Kentucky has been steadily gaining ground since the recession that started in 2008.

Sawmills and secondary wood manufacturing were estimated to show increases in direct revenues in 2016; together they are responsible for \$3.4 billion in direct revenues, an increase of over \$500 million from 2015. Logging, pulp and paper, paper converters and wood residue manufacturing saw decreases in direct revenues. Kentucky's pulp and paper sub-sector was estimated to decline in 2016 to \$830 million. This decrease can largely be contributed to the closing of the Verso facility, which was one of Kentucky's two pulp and paper facilities. The logging sector with direct revenues of \$149 million in 2016, lost approximately \$20 million compared to 2015, reflecting the decline in the pulpwood market in western Kentucky associated with the closure of the Verso facility.

Wood exports were slightly less in 2016 with \$283 million shipped compared to \$295 million in 2015. Asia imported more than \$105 million of Kentucky wood products in 2016; however, Europe is still the leading export purchaser at nearly \$107 million. In 2016, wooden barrels, both new and used, led exports at more than \$89 million mostly going to Europe. Oak lumber was the second leading export at more than \$71 million with over \$42 million of that exported to Asia.

**Figure 1. Annual Direct and Total Economic Contribution of the Kentucky Forest Industry (2012-2016)**



Source: Kentucky Forestry Economic Impact Reports. [www.ukforestry.org](http://www.ukforestry.org)

# Economic Contribution of Forest and Wood Industries

Kentucky forest industries include 722 wood, paper, and paper converting manufacturing facilities across the Commonwealth (Figure 2). The occurrence of these facilities in 110 out of 120 counties, indicates broad distribution of the \$14.4 billion contribution and highlights the importance of this sector to rural communities. However, as indicated by the clustering of industries in urban areas, forest industry is also an important economic force in many of our urban areas.

## Forestry Sub-sectors

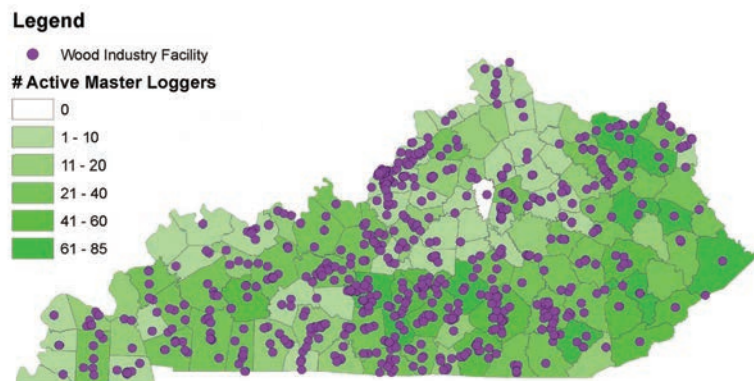
**Logging:** Logging firms had a direct economic contribution of \$149 million in 2016, a decrease of 12 percent from 2015 (Figures 3). While logging is the smallest sub-sector, it is arguably the most important as it provides the raw material for the primary, pulp and paper, and wood residues sub-sectors. Much of the secondary manufacturers derive their materials from primary manufacturers indicating that the logging sub-sector feeds the supply chain for over one-half of the \$14.4 billion in contributions provided by the forestry sector.

**Solid wood manufacturing:** Solid wood manufacturing includes both primary wood manufacturing (ex. lumber mills) and secondary wood manufacturing (ex. cabinet manufacturing). In 2016, primary manufacturing increased, by 4.4 percent, compared to 2015. Secondary manufacturing increased significantly to \$2.2 billion from \$1.8 billion in 2015, a 22 percent increase. However, this growth only increased employment in this sub-sector by 4.4 percent to an estimated 11,915 employees (Figures 4). Direct employment in solid wood manufacturing is estimated to be 16,208.

**Paper:** Paper represents a sizable portion of the forestry sector at an estimated \$4.8 billion overall including pulp and paper manufacturing and paper converters. The latter are industries that manufacture finished paper products. Both sub-sectors had declines in 2016 compared to 2015. However, employment and revenue were much lower in the pulp and paper sub-sector, as compared to the paper converters, as the closing of the Verso mill continues to weigh heavily on this sub-sector.

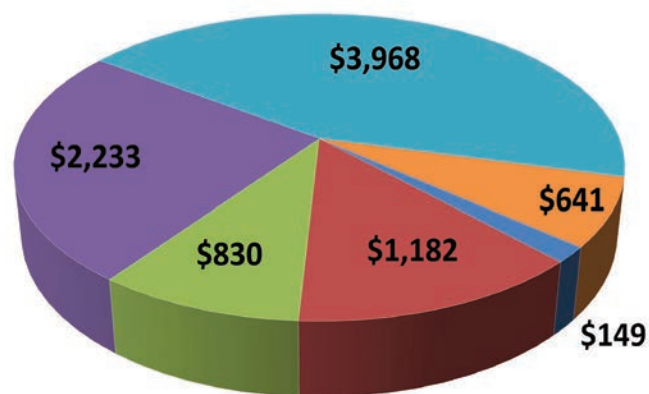
**Wood residue:** Wood residues from both sawmilling and secondary manufacturers, including bark and wood mulch, decreased in 2016, providing a direct contribution of \$641 million, a 9.7 percent decrease over 2015.

Figure 2. Kentucky Wood Industries and Master Logger Distribution 2016



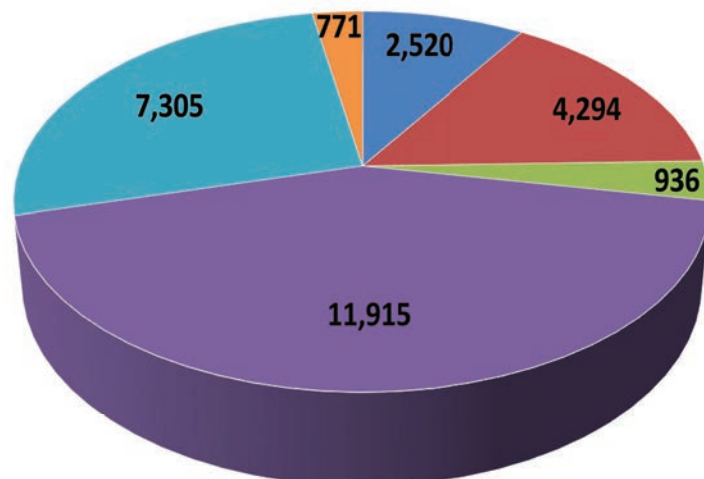
Source: Kentucky Master Logger Database and Kentucky Forest Products Industry Directory

Figure 3. Direct Economic Contribution by Kentucky Forestry Sub-Sectors in Millions



Figures 3 and 4 source: IMPLAN Data for Kentucky and the Kentucky Forest Products Industry Directory

Figure 4. Direct Employment by Kentucky Forestry Sub-Sectors



# Timber Output and Prices

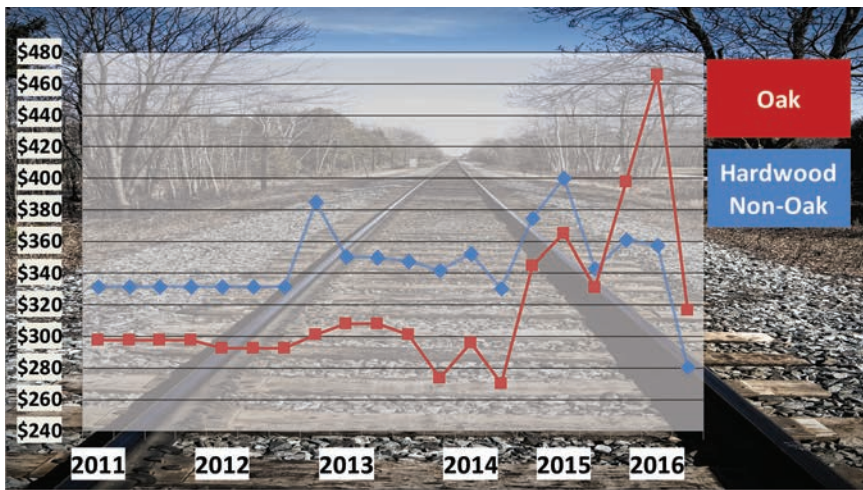
The volume of roundwood (logs of all types) was estimated to total an equivalent of 746 million board feet in 2016. While slightly less than the estimated 762 million board feet harvested in 2015, estimates of roundwood production have been relatively stable over the last several years after dipping in 2009 and 2010 in response to the recession. The closing of the Verso mill facility that purchased over one million tons of roundwood annually contributed to the reduction. For the majority of 2016, delivered log and pulpwood prices have remained stable or declined slightly for a number of products with the exception of stave

**Table 1. Delivered Grade 1 Sawlogs Prices for Major Species in Kentucky (\$/MBF)**

	High Value Sawlog	High Value Veneer	Low Value Veneer
Black Walnut	\$1,694	\$4,071	\$1,300
White Oak	\$1,100	\$2,800	\$1,350
Red Oak	\$800	-	-
Hard Maple	\$789	\$1,750	\$1,000
Black Cherry	\$650	-	-
Ash	\$617	-	-
Yellow-poplar	\$535	-	-

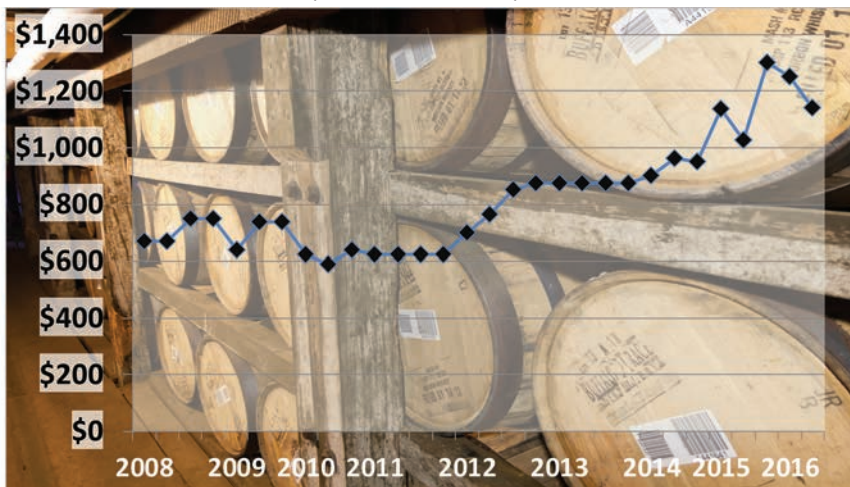
Source: Kentucky Division of Forestry's Delivered Log Price Data average of 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2016. (MBF = 1,000 board feet)

**Figure 5. Delivered Tie Logs Prices in Kentucky 2011-2016 by Quarter (\$/MBF)**



Sources above and below: Kentucky Division of Forestry's Delivered Log Price Data (MBF = 1,000 board feet)

**Figure 6. Delivered Stave Logs Prices in Kentucky 2008-2016 by Quarter (\$/MBF)**



logs that maintained strong prices in 2016. The latter was predicted as stave logs are used for the production of white oak barrels required by the expanding whisky and wine industries. The statewide delivered log price for other roundwood products including lumber logs, railway tie logs, and lower value construction logs used for manufacturing products such as construction mats and pallets were flat or lower for many species. Black walnut still maintained the highest delivered log value followed by white and red oak, hard maple, black cherry, ash and yellow-poplar. Flat or declining delivered log prices for these products was related to several factors including relatively soft single family housing starts. Railway tie log pricing and demand has diminished and is related to less coal shipments and positioning of major North America railway companies that has led to less overall railway infrastructure repair.



# Exports

Kentucky's wood related exports declined slightly in 2016 to \$283 million (Table 2). Asia continued to challenge Europe as a leading export destination for Kentucky wood related products; Asia imported more than \$105 million while Europe imported over \$107 million. Once again, oaks continue to dominate Kentucky wood exports. More than \$89 million in new and used wooden casks (barrels) were exported in 2016. Oak lumber was the next largest export at over \$71 million. In all, oak related exports exceeded \$164 million in 2016.

**Table 2. Top 5 Kentucky Wood, Paper, and Pulp Exports in 2016 in Millions**

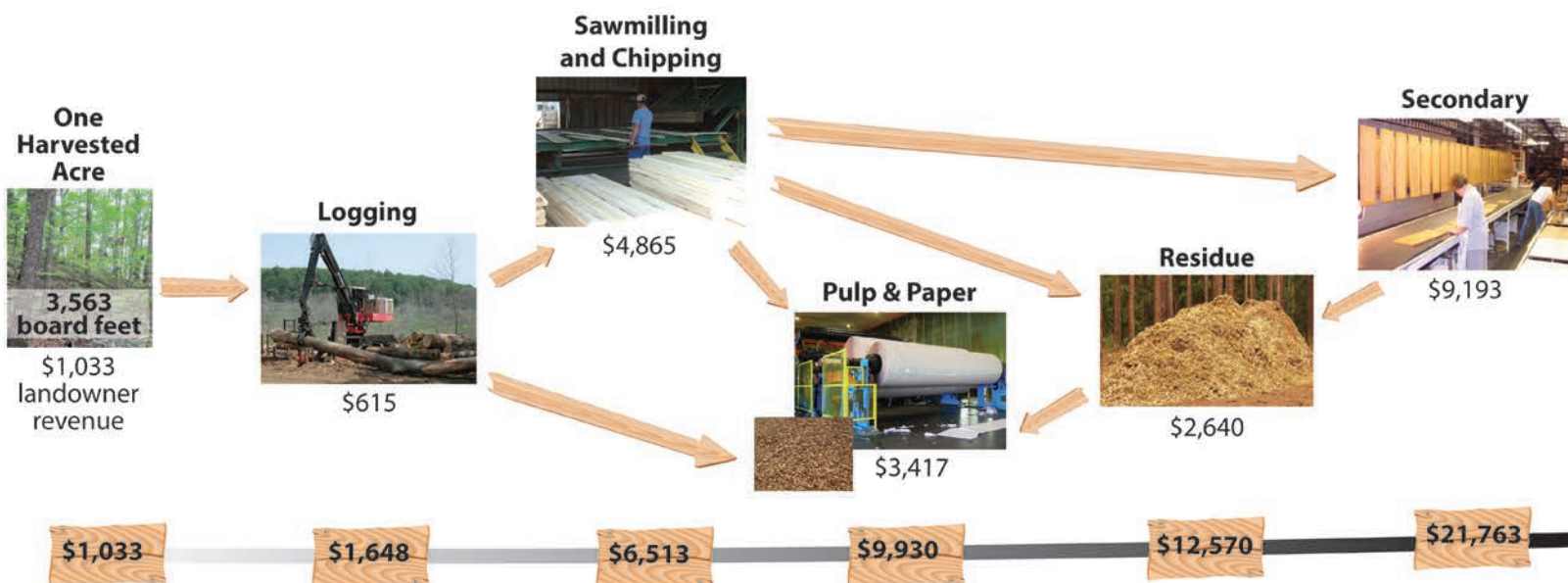
<b>Wooden Casks (Barrels)</b>	\$89,843,297
<b>Oak Lumber</b>	\$71,509,913
<b>Hardwood Lumber</b>	\$30,290,142
<b>Ash Lumber</b>	\$16,418,475
<b>Chemical Wood Pulp</b>	\$9,749,623

Source: U.S. Department of Agriculture Foreign Agricultural Services

# The Economic Contribution of One Acre of Harvested Timber

Kentucky's forests provide the timber resources for a significant portion of the forestry sector's economic contribution. This includes timber revenues for landowners selling timber and revenues from logging, milling, residual products such as bark, and secondary industries that use lumber and other primary products. Therefore, every acre of timber that is harvested yields significant returns, not just for the landowner, but for the Commonwealth as a whole. In Kentucky, on average, a timber harvest yielded 3,563 board feet of timber. In 2016, the average value of standing timber was \$0.29 per board foot or \$1,033 of revenue for the landowner for each acre harvested (Figure 7). The average harvested acre also provided \$615 in direct revenue for the loggers who cut and haul the timber. The majority of our timber is processed at mills in Kentucky resulting in \$4,865 in direct revenues for sawmills and \$3,417 for pulp and paper mills. By-products such as bark from the mills also are an important revenue generator, yielding \$2,640 per acre of timber harvested. Finally, our secondary industries that manufacture finished furniture, furniture parts, flooring, barrels, and a host of other products contributes significant added value to the forest sector yielding \$9,193 per acre of harvested timber. In total, each acre of harvested timber resulted in a direct economic contribution of \$21,763 to the Commonwealth.

**Figure 7. 2016 Economic Contribution of One Acre of Harvested Timber in Kentucky**



Cumulative Direct Economic Contributions of a Harvested Woodland Acre



## ***Kentucky's Forests:***

### ***A Renewable Resource in Need of Nurturing***

This economic contribution report highlights the importance of the forest and wood industry to Kentucky's economy and serves as a reminder that this economic contribution begins with Kentucky's forests. In addition to this economic contribution, Kentucky's forests provide a wide variety of ecosystem services such as cleaner air and water, as well as critical habitat for wildlife. Unfortunately, most of Kentucky's forests are not as productive or healthy as they could be and they face a wide variety of threats that can undermine their sustainability. Invasive plants and insects are an increasing threat that continue to spread. Drought can contribute to catastrophic wildfires that are far too often caused by humans and both harbor the potential to destroy Kentucky's forests. In addition, too few forest management practices, that can make Kentucky's forests more productive and healthy, are being implemented. The latest Kentucky forest inventory data, collected by the Kentucky Division of Forestry in cooperation with the United States Forest Service, shows that of the more than 74 billion board feet (Int. ¼ inch) net volume of sawtimber size trees currently standing in Kentucky's forests just over 10 billion board feet is considered Grade 1 and more than 47 billion board feet is considered Grade 3 or below. These issues should remind us that we must be more vigilant in supporting and managing Kentucky's forests. Now, more than ever, it is critical that we monitor the quantity and quality of Kentucky's forests and assist the owners (mostly families) in nurturing this vital renewable resource.

Department of Forestry  
Forestry Extension Office  
University of Kentucky  
216 Thomas Poe Cooper Bldg.  
Lexington, KY 40546-0073  
859.257.7597  
[www.ukforestry.org](http://www.ukforestry.org)

#### **FORFS 17-17**

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Nancy Cox, Director of Cooperative Extension Programs, University of Kentucky College of Agriculture, Food, and Environment, Lexington, and Kentucky State University, Frankfort. Copyright © 2017 for materials developed by University of Kentucky Cooperative Extension. This publication may be reproduced in portions or its entirety for educational or nonprofit purposes only. Permitted users shall give credit to the author(s) and include this copyright notice. Publications are also available on the World Wide Web at [www.ukforestry.org](http://www.ukforestry.org)