

# AN ANALYSIS OF APPALACHIAN HARDWOOD PRODUCTS IN THE CHINESE MARKET

*Jingxin Wang*\*†

Associate Professor

*Jinzhuo Wu*

Graduate Research Assistant

*James P. Armstrong*†

Associate Professor

West Virginia University

Division of Forestry and Natural Resources

Morgantown, WV 26506

(Received May 2009)

**Abstract.** To improve information on log and lumber trade between the Appalachian region of the United States and China, 50 Chinese firms identified as potential and current hardwood products buyers were surveyed using a stratified random sampling method from January to May 2008. A series of questions were posed on the importance of certain attributes of the US products and how to make the trading process more efficient. Sampled information included business activities, location(s), annual sales, product distribution of firms importing hardwood products, customer satisfaction, potential barriers to trade, principal sources of supply, product types, grades, and species of hardwood products imported from the United States. Results indicated that the Appalachian region of the United States is an important hardwood source and will continue to play an important role in the Chinese market. Red and white oaks were the most frequently imported species, followed by hard (sugar) maple, black cherry, soft maple, and ash. The Appalachian hardwood logs entered the markets largely in east and north central China, whereas the hardwood lumber importers were mainly distributed in east, south, and north central China. Some ongoing issues such as the impact of Russia's log tariff, the Lacey Act, and others on China's wood supply were also raised. The results should be helpful for Appalachian hardwood producers to further explore opportunities to promote their products in the Chinese markets.

**Keywords:** Log and lumber export, wood trade, survey, market analysis, Appalachian hardwood.

## INTRODUCTION

The Appalachian region (Fig 1) of the United States covers 500,000 km<sup>2</sup> that follows the spine of the Appalachian Mountains from northern Mississippi to southern New York. Hardwood logs and lumber are the primary forest products produced in the region. Markets for hardwood products are affected by both national and international supply and demand forces, requiring enhanced knowledge and understanding of marketing strategies at both levels (Luppold and Sen-dak 2004). Buehlmann et al (2007) assessed the

impact of globalization on large Appalachian sawmills and found that more than 90% of respondents were working harder to develop relationships with their customers and 75% were becoming more aggressive in searching for new markets as a result of globalization. As forest product producers attempt to enter or expand into export markets, their demand for market-related information increases (Armstrong et al 1993).

A major overseas hardwood log and lumber market for the Appalachian region is China (Urban 2002), in part for the furniture industry. China imported 37.1 Mm<sup>3</sup> of logs valued at \$5.35 billion and 6.55 Mm<sup>3</sup> of lumber valued at \$1.77 billion in 2007 (Global Wood 2008), of which 13.68 Mm<sup>3</sup>

\* Corresponding author: jxwang@wvu.edu

† SWST member

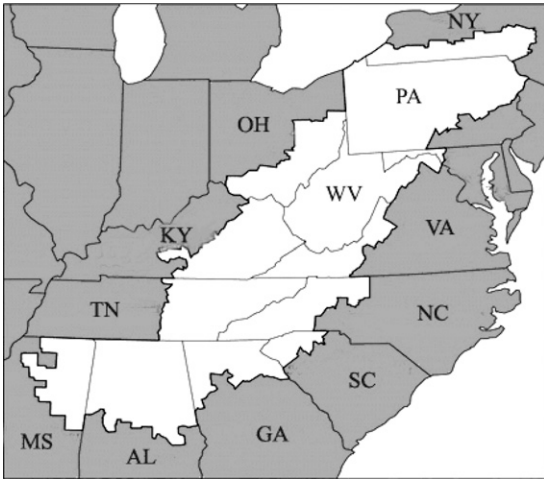


Figure 1. Appalachian region of the United States.

was hardwood logs and 3.82 Mm<sup>3</sup> was hardwood lumber (Petry and Zou 2007). Russia remained the most important supplier for the Chinese wood market, although the export tariffs on logs have increased since 2007. The United States had become the second largest lumber (sawnwood) supplier in the Chinese market behind Russia in 2007. In 2007, the most recent year for which data are available, the United States was the leading exporter of hardwood lumber and logs in the world with value of shipments of approximately \$1.4 billion and \$817 million, respectively (FAO 2009). During this period, China imported an estimated \$222 million of hardwood lumber from the United States (FAO 2009). Approximately 88% by value of the US lumber exported to China was hardwoods (USDC 2008).

Several studies have been undertaken to investigate hardwood markets in China. One of the earliest (Zhang et al 1998) analyzed trends in China's wood products imports and exports and addressed the change in consumer preference from softwood logs and lumber in the 1980s to hardwood logs and veneer/plywood in the 1990s because of a deficit in high-quality timber in the domestic market. They concluded that China was a huge potential market for US wood products in the long run and suggested some keys to accessing this market such as more flexible credit terms, joint ventures, and promotional

activities. Sun and Hammett (1999) investigated hardwood use in China's furniture industry by a mail survey and found that red oak from the United States was the most popular temperate hardwood species imported. Bowe et al (2006) interviewed 45 companies regarding their hardwood lumber-purchasing practices in China and found that US lumber suppliers face stiff global competition in the hardwood market.

Wood trade policies could play an important role in the hardwood trade between the United States and China. A recently amended law by the US Congress, the Lacey Act, is designed to stem the flow of goods from illegally harvested wood and document the foreign sources of wood-based products. US importers are required to declare the species, quantity, value, and origin of wood used in their products. Failure to comply with the Act will cause civil administrative penalties, forfeiture of the trafficked goods, criminal fines, or imprisonment. Many of China's wood product exporters have imported raw wood materials from countries such as Russia, Papua New Guinea, Indonesia, Gabon, and the Solomon Islands, where illegal harvesting and other legal violations are well documented (Gregg and Porges 2008). Potential risks exist for the wood products made in China being treated as suspect timber. The implementation of Lacey Act will reduce the competition from countries with higher levels of suspicious wood and create great opportunities for the hardwood producers in the United States. Chinese manufacturers/exporters, especially large companies, are extremely concerned about the policy changes regarding the wood products trade occurring in the United States. They are increasingly interested in shortening and better monitoring their wood supply chains to gain access to new markets and maintain access to existing ones. By 2009, over 660 Chinese wood companies had obtained Forest Stewardship Council Chain of Custody certification (CFCN 2009).

Economic competition in the Appalachian region among hardwood forest products producers has increased within the last decade, forcing facility closures and increases in lower-grade hardwood

production. As a result of these pressures, the forest industry needs improved forest product markets and promotional marketing techniques to increase the economic competitiveness of their products, especially during the current economic downturn. A better understanding of China's hardwood products market could help the Appalachian hardwood producers market their products.

Therefore, the primary goals of this study were to analyze current exports of Appalachian hardwood products to the Chinese market, identify the potential opportunities to expand export trade, and enhance the economic competitiveness of Appalachian hardwood industries in the global forest product trade.

#### METHODS

This study was conducted through a formal mail survey of Chinese firms identified as potential and current US hardwood products buyers. The contact information of the hardwood product importers was provided by the China Timber Distribution Association in China (CTDA 2007), one of the most important nationwide organizations in the wood industry. The association has more than 600 members and includes manufac-

turers, importers/exporters, retailers, wholesale marketers, and research institutions.

The surveyed companies represented approximately 8% of the member companies of the China Timber Distribution Association. However, the sampled companies are larger and have import/export experience. Therefore, the data obtained from the survey can reflect the US hardwood products purchased in China to a limited extent. In 2007, China imported 1.07 Mm<sup>3</sup> of sawnwood (lumber) from the United States (IHB 2008). The surveyed imported hardwood lumber was approximately 0.10 Mm<sup>3</sup>, corresponding to sampling rate of about 8%.

A stratified random-sampling method was used. The population was divided into five subpopulations (regions) and random samples were taken of each region based on the proportion of the size of the stratum of the entire population. The five regions were: east China (Shanghai, Zhejiang, Jiangsu, and Shandong provinces), north central China (Beijing, Hebei, and Tianjin), south China (Guangdong and Fujian provinces), northeast China (Liaoning, Jilin, and Heilongjiang provinces), and west China (Guizhou, Yunnan, and Guangxi) (Fig 2). The total sample size of the survey was 50: east China (22), south China (15),



Figure 2. Chinese hardwood product importers by region.

north central China (6), northeast China (4), and west China (3).

The survey was managed by two agencies: a market research and consultant company and the China Timber Distribution Association in Beijing. A pretest questionnaire was sent to the representatives in Beijing who talked with the managers in the sample, resulting in a few changes. The initial mailing was made in January 2008. One month later, follow-up mailings were sent to nonresponders. The survey questions were designed for answers related to basic business information, hardwood import sources, concerns during purchase of hardwoods, volume and species imported from the Appalachian region, evaluation of US hardwood suppliers, and future purchase plans of hardwood logs and lumber. The data were analyzed using the Statistical Analysis System. The region with the fewest samples (west China) was not included in statistical analysis by region.

## RESULTS AND DISCUSSION

Of the 50 Chinese firms surveyed, 48 questionnaires were returned, a response rate of 96%. Of 46 firms that purchased hardwood products in 2007, a majority were located in east and south China, accounting for 46 and 30% of the total, respectively. This is partly because of sufficient production capacity and ease of access to imported hardwood products. The purchasers located in the north central, northeast, and west China were 13, 9, and 2%, respectively.

### Business Activities

**Primary business activities of Chinese purchasers.** The survey addressed the primary business activities of the hardwood products purchasing firms, which were classified as: 1) manufacturers; 2) import and export traders; and 3) manufacturers and traders. Of the responding firms, 56% were manufacturers, 33% were traders, and the remainder was engaged in both. As expected, approximately 77% of the manufacturers and 80% of the traders were located in east

and south China (Table 1). Of the respondents, 41% were large-scale firms with annual sales of more than 10 million Chinese Yuan (about \$1.45 million based on 6.89 Yuan per US dollar) in 2007. Most were manufacturers and were located in east China.

### Purchase and sales of hardwood products.

The firms were asked if they purchased hardwood lumber and the grade they purchased most based on volume in 2007. Forty-two firms (87.5%) responded affirmatively; of these, 69% imported Firsts and Seconds and One Face (FAS & 1F), of which 48% reported that more than 60% of lumber purchased was FAS & 1F. Also, 43% purchased Select hardwood lumber, of which one-half purchased more than 50% Select in volume. The respondents also purchased No. 1 Common (1C) (26%) and No. 2 Common (2C) (7%).

Firms were asked the types of businesses that purchased their processed products. More than one-half of the responders sold their products to wholesalers and retailers (69%). Manufacturers receiving the products were in furniture (35%), molding/millwork (27%), flooring (21%), and architectural materials (19%).

Forty-two percent of the firms sold their products to the domestic market, mainly in the developed regions such as Shanghai, Beijing, and Guangdong province. The United States (55%), Europe (44%), and Japan (11%) were the top three export destinations of processed hardwood products.

Table 1. Primary business type of surveyed Chinese importers by region.

Region	Number of firms			
	Manufacturers	Traders	Manufacturers and traders	Total
East China	12 (8) <sup>a</sup>	7 (2)	2 (1)	21 (11)
North central	4 (3)	0 (0)	2 (0)	6 (3)
Northeast	2 (1)	2 (1)	0 (0)	4 (2)
South China	8 (0)	5 (3)	1 (0)	14 (3)
West China	0 (0)	1 (0)	0 (0)	1 (0)
Total	26 (12)	15 (6)	5 (1)	46 (19)

<sup>a</sup> The numbers in parentheses are large-scale firms (annual sales greater than 10 million Chinese Yuan [2007 value]).

**Hardwood Product Imports**

Of 48 respondents, 39 (81.3%) imported hardwood products. The primary imported hardwood products were logs and lumber.

Respondents purchased hardwood products from multiple sources and regions of the world (Fig 3). Approximately 46% of the firms purchased hardwood products from the domestic market. Foreign sources included North America, Europe, southeast Asia, and Africa. They purchased hardwood products from North America (mainly the United States, 48%), Russia (19%), and Europe (23%). According to a previous study (Global

Wood 2009a), southeast Asia and South America were also major sources; however, the market share of southeast Asia is declining. This indicated that US hardwood products have gained a fairly large market share in China although they face competition from many countries and regions.

Respondents were asked to indicate what product and service attributes they are most concerned about in hardwood products trade. More than one feature could be selected. Quality and price were the top concerns (Fig 4) followed by multiple species and grades and favorable credit terms. Previous studies showed that the Chinese

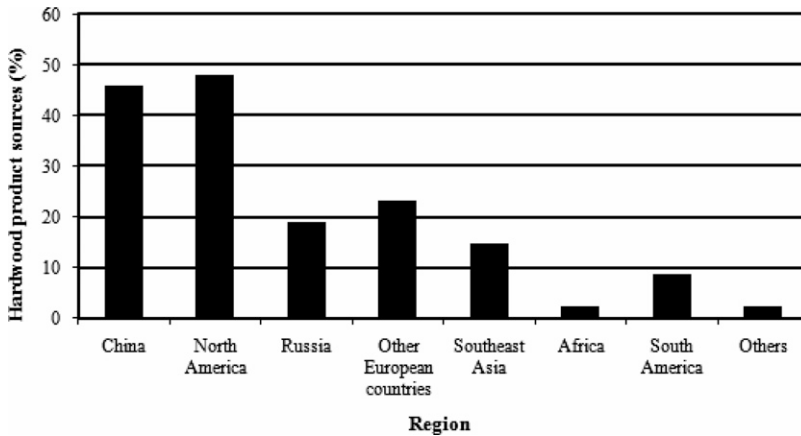


Figure 3. Main sources of hardwood products in China by region.

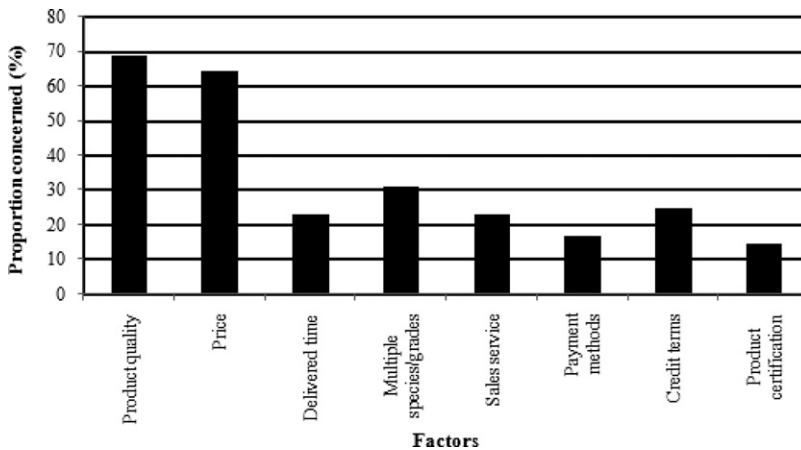


Figure 4. Factors with Chinese hardwood purchasers most concerned.

bought lumber based primarily on price (Bowe et al 2006). Thus, US hardwood suppliers should pay more attention to these features when conducting business with their Chinese customers.

### Hardwood Products Imported from the Appalachian Region

Approximately 60% of the respondents purchased hardwood products from the United States, of which 13 (44.8%) buyers reported that their US supplier was the largest among all suppliers and accounted for more than 80% of the total value of imported lumber. Fifty-eight percent of the respondents purchased hardwood products from the Appalachian region.

To determine if they were satisfied with their US suppliers, respondents were encouraged to score a variety of issues related to purchase of hardwood products on a scale of 1 (not satisfied) to 5 (very satisfied). Chinese buyers were rather satisfied with the long-term supply, various species, credit terms, and total quality of products now being provided by US suppliers. The means of these attributes were significantly different from the median value of 3 at the 5% level, simply indicating that these attributes were important to Chinese buyers. However, the ratings for price, delivery time, and transportation packaging received were lower than the previous factors (Table 2). The evaluation indicated that the Chinese hardwood product purchasers were generally satisfied with their US suppliers. The limited domestic supply of hardwood products in China and unstable sources abroad were the main reasons for choosing US hardwood suppliers. However, there are still some ongoing issues such as slightly higher prices, transportation packaging, and delivery time that need to be improved. Other barriers in the process of hardwood product imports indicated by the Chinese purchasers include the complexity of import procedures, long fumigation time, communication difficulties, and understanding of trade laws and regulations. Developing better communication channels could be essential for US hardwood suppliers to keep existing mar-

kets and to identify new customers in the Chinese market.

Several questions were related to the hardwood products imported from the Appalachian region of the United States. Ninety-six percent of the respondents who imported from the United States (58% of firms surveyed) purchased hardwood products from the Appalachian region. Hardwood products were also imported from the US South (21%) and West (14%). The total surveyed volumes of hardwood logs and lumber imported from the Appalachian region in 2007 were about 30,000 and 102,000 m<sup>3</sup>, respectively (Table 3). The 95% confidence interval for the mean of hardwood logs imported was (2073 – 6608) m<sup>3</sup>. The 95% confidence interval for the mean of hardwood lumber imported was (3826 – 13,636) m<sup>3</sup>.

The preference of Chinese purchasers for Appalachian hardwood products by regions was analyzed (Fig 5). Appalachian hardwood logs

Table 2. Evaluation of US hardwood products supplier attributes by Chinese importers.<sup>a</sup>

Items	Number of respondents	Mean	Standard deviation	95% confidence interval for mean
Multiple species	26	3.76**	1.05	3.33 – 4.19
Multiple grades	26	3.64**	1.25	3.12 – 4.16
Long-term supply	26	3.84**	1.14	3.37 – 4.31
Delivery time	26	3.28	0.94	2.89 – 3.67
Transportation package	26	3.36	0.99	2.95 – 3.77
Price	26	3.52**	1.05	3.09 – 3.95
Credit terms	26	3.76**	1.13	3.29 – 4.23
Product quality	26	3.72**	1.14	3.25 – 4.19
Service quality	26	3.64**	1.19	3.15 – 4.13

<sup>a</sup> 1 = not important; 5 = very important.

\*\* Mean value is significantly different from median value of 3 at 5% significance level.

Table 3. Statistics of Appalachian region hardwood products imported by surveyed Chinese importers in 2007.

Products	Number of importers	Number of importers revealed volume	Volume imported (1000 m <sup>3</sup> )	Mean (1000 m <sup>3</sup> )	Standard deviation (1000 m <sup>3</sup> )
Hardwood logs	12	7	30.39	4.34	0.82
Hardwood lumber	25	15	102.56	6.84	3.12

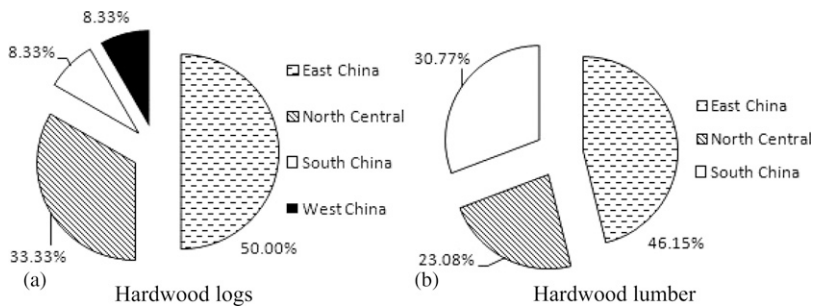


Figure 5. Surveyed Chinese importers of Appalachian hardwood products by region.

entered into the markets primarily in east and north central China. Hardwood lumber importers were mainly in east, south, and north central China. Sun et al (2008) stated that Shanghai and Shenzhen, the main metropolitan areas in east and south China, respectively, were the leading ports of entry for tropical and temperate hardwood lumber in 2002. The surveyed volume of hardwood logs imported was significantly different among east, south, and north central China ( $F = 7.45$ ;  $p = 0.0448$ ). There was no significant difference for surveyed volume of hardwood lumber imported among east, south, and north central China ( $F = 2.07$ ;  $p = 0.1689$ ). The reasons that most hardwood products were distributed to east, south, and north central China were because of sufficient production capacity, more entry ports, and other trade and distribution-related factors. Meanwhile, the wood furniture and products industry in north-east China has been growing in recent years. Heavily dependent on overseas raw material markets such as Russia, the wood supply has dropped dramatically because of Russia's increased export tariff on logs. Now, furniture and flooring manufacturers and other consumers of wood products are actively seeking new sources of materials from North America and other regions.

Various species of hardwood products were imported from the Appalachian region. Red and white oaks were the most frequently imported species. Log imports included red oak (14.58%), white oak (14.58%), hard (sugar) maple (12.5%), ash (8.33%), hickory (8.33%),

black cherry (6.25%), and yellow poplar (6.25%). Hardwood lumber imported by species was white oak (29.17%), red oak (22.92%), black cherry (18.75%), soft maple (16.67%), hard maple (14.58%), and ash (12.50%). There were significant differences among the five regions of China in terms of hardwood lumber species imported ( $F = 16.55$ ;  $df = 4, 40$ ;  $p = 1.9E-07$ ). Red oak and white oak were the most popular species followed by black cherry, soft maple, hard maple, and ash in east, south, and north central China. Red oak has become one of the most popular hardwood species for construction of interiors, furniture, and decoration in southern China. According to the US trade statistics, the top hardwood lumber species exported to China in 2007 in terms of value were yellow poplar, red oak, red alder, white oak, maple, ash, black walnut, and black cherry (USDA 2008). Because yellow poplar represents a significant fraction of the growth and production in the Appalachian region, there could be enormous opportunities for expanding the yellow poplar market share in China.

Respondents were also encouraged to report the grades of lumber and corresponding proportions imported from the Appalachian region. About 31.3 and 25% of the respondents imported FAS & 1F and Select hardwood lumber, respectively. Only a few purchasers imported 1C (8.3%) and 2C (6.3%). This result is slightly different from the previous study (Bowe et al 2006) that reported FAS and No. 1 Common to be the top two grades imported from the United States.

The future purchasing of hardwood logs and lumber by Chinese consumers from the United States was also surveyed with three options, including increasing, decreasing, and unchanging. If respondents selected “decreasing,” they were encouraged to report the reasons. Results showed that 14.58% of hardwood purchasers will increase their purchases and 43.75% will stay at an unchanged level. The ever-increasing production cost was the main reason that some importers cut hardwood imports.

#### POTENTIAL MARKET IMPLICATIONS

The average price for imported logs in China has been increasing, whereas the price for imported lumber is relatively stable. Because of the international financial crisis, the import of logs in 2008 dropped from 2007, whereas sawnwood imports continued to rise (Global Wood 2009b). That is because some manufacturers used sawnwood as raw materials in place of logs. Based on our survey, many hardwood buyers will maintain or increase their purchases from the United States in the near future. A few of them will decrease their imports because of pressure from increasing production costs. This can be mainly ascribed to the following reasons: 1) Although China increased its logging quota by 11% in the 11th Five Year Plan (2006 – 2010) (Petry and

Zou 2007), it still faces a severe lack of forest resources, especially hardwood products for interior decoration, flooring, and furniture manufacturing that rely primarily on imports; and (2) Russia, the largest wood supplier, has increased its export tariff on logs to 25%, which resulted in 25% decrease in the imports of logs in 2008. Although Russia has delayed the move to 80% log export tax until 2009 or later, further declines in wood supply and higher prices for imported logs are expected. If the 80% log export tax were implemented in 2010, most of the timber imported from Russia would be sawnwood. The comparison for the wholesale imported timber prices shows that the sawnwood price for Mongolian Scots pine, one of the most important species imported from Russia, is 12% higher than the price for logs on average (Fig 6). For temperate hardwood logs such as oak and beech, the Russian export tariff will be increased to a 40% level or a minimum of \$67/m<sup>3</sup> (€50/m<sup>3</sup>).

Hardwood products from the United States will become more competitive in the Chinese market, which is aided by the weak US dollar. Southeast Asia has been the major tropical wood supplier to China, but its supply has been declining because of restrictions in harvesting of tropical hardwood and growing international pressure on illegal logging. All of these create great opportunities for the US

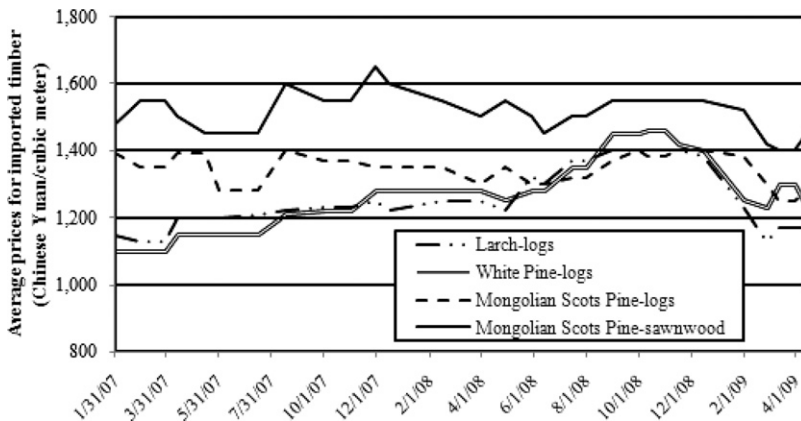


Figure 6. Average prices for the most imported timber from Russia.



hardwood products, which have the advantages of sustainability, high quality, and price competitiveness.

The current slowdown of the housing market in the United States has forced the hardwood industry to cut production by more than 40% according to a recent survey on the hardwood industry in the Appalachian region (Wang et al 2009). Some predict that the housing market will not recover until 2010. China, although impacted by the global financial crisis, will still have a strong demand for forest products due to the central government's stimulus package on economy (approximately 4 trillion Yuan), operation ability of existing facilities, and advantages of proficient technology and relatively low production/labor costs. Therefore, China will still be one of the most important overseas markets for the US hardwood producers in the near future.

#### CONCLUSIONS

The Appalachian region of the United States is an important hardwood supply source for the Chinese wood market. The oaks, the largest and most important group of hardwood species in the region, were the primary species imported by Chinese purchasers followed by hard maple, black cherry, and soft maple. Red oaks are popular for a wide range of uses, including flooring, furniture, and cabinetry, and have become one of the most important US species in the Chinese market. The supplier evaluation indicated that Chinese importers were mostly satisfied with the long-term supply of US hardwood products. Most Appalachian hardwood products were distributed to east, south, and north central China because of sufficient production capacity, more entry ports, and other trade and distribution-related factors. Approximately 58% of the surveyed hardwood purchasers will increase their purchases or stay unchanged. Therefore, China will continue to be one of the most important and strong overseas markets for US hardwood producers in the near future. The results could be helpful for Appalachian hardwood producers

to further explore and promote their products in the Chinese markets.

#### ACKNOWLEDGMENTS

We acknowledge the USDA Forest Service Wood Education and Resource Center for providing financial support to this study. We also thank experts and representatives with the two agencies in Beijing for managing the survey, data collection, and suggestions. This manuscript is published with the approval of the Director of West Virginia Agricultural and Forestry Experimental Station as Scientific Article No. 3058.

#### REFERENCES

- Armstrong JP, Ponzurick TG, Luppold WG (1993) US hardwood lumber exports to Canada: An assessment of market segments. For Prod J 43(6):13 – 18.
- Bowe SA, Bumgardner MS, Wang X (2006) An assessment of hardwood lumber markets in China. Pages 460 – 469 in Proc of 15<sup>th</sup> Central Hardwood Forest Conference. February 27 – March 1, 2006, Knoxville, TN.
- Buehlmann U, Bumgardner M, Schuler A, Barford M (2007) Assessing the impacts of global competition on the Appalachian hardwood industry. For Prod J 57(3):89 – 93.
- CFCN (2009) Directories of Chinese companies receiving FSC forest management certification. China Forest Certification Network. <http://www.cfcn.cn/xiang.asp?id=861> (6 April 2009).
- CTDA (2007) Membership directory. China Timber Distribution Association in China, Beijing, China.
- FAO (2009) FAOSTAT-Forestry. Food and Agricultural Organization. United Nations. <http://faostat.fao.org/site/630/default.aspx> (3 May 2009).
- Global Wood (2008) Market info—China wood products prices. 15 February 2008. <http://www.globalwood.org/market1/aaw20080201d.htm> (5 May 2008).
- Global Wood (2009a) Market info—China wood products prices. 1 – 15 June 2009. [http://www.globalwood.org/market/timber\\_prices\\_2009/aaw20090601d.htm](http://www.globalwood.org/market/timber_prices_2009/aaw20090601d.htm) (12 October 2009).
- Global Wood (2009b) Market info—China wood products prices. 1 – 15 March 2009. <http://www.globalwood.org/market1/aaw20090301d.htm> (16 April 2009).
- Gregg R, Porges A (2008) Amendment to the US Lacey Act: Implications for Chinese forest products exporters. Forest trends. <http://www.illegal-logging.info/uploads/LaceyActBriefChinaEN.pdf> (28 March 2009).
- IHB (2008) China reports strong timber trade data for 2007. [http://www.ihb.de/fordaq/news/China\\_timber\\_trade\\_16578.html](http://www.ihb.de/fordaq/news/China_timber_trade_16578.html) (12 July 2008).

- Luppold WG, Sendak PE (2004) Analysis of the interaction between timber markets and the forest resources of Maine. *Nor J Appl For* 21(3):135 – 143.
- Petry M, Zou Q (2007) China, Peoples Republic of Solid wood products annual 2007. USDA Foreign Agriculture Service Gain Report, CH7057.
- Sun X, Hammett AL (1999) Chinese furniture industry: Its development and wood use. *For Prod J* 49(10): 31 – 35.
- Sun X, Katsigris E, White A (2008) Meeting China's demand for forest products: An overview of import trends, ports of entry, and supplying countries, with emphasis on the Asia-Pacific region. [http://www.forest-trends.org/documents/publications/China%20Import%20Overview\\_English06-02.pdf](http://www.forest-trends.org/documents/publications/China%20Import%20Overview_English06-02.pdf) (28 June 2008).
- Urban H (2002) US furniture makers heed the great call of China. *Wood Wood Prod* 4:64 – 72.
- USDA (2008) Foreign Agriculture Service online database. <http://www.fas.usda.gov/ustrade/> (16 June 2008).
- USDC (2008) TradeStats Express online database. US Department of Commerce. <http://tse.export.gov/> (28 June 2008).
- Wang J, Wu J, DeVallance D, Armstrong J (2009) Appalachian hardwood product exports—An analysis of the current Chinese market. *For Prod J* (in review).
- Zhang D, Liu J, Granskog J, Gan J (1998) China: Changing wood products markets. *For Prod J* 48(6):14 – 20.