

Material Use and Production Changes in the U.S. Wood Pallet and Container Industry: 1992 to 2006

By Robert J. Bush and Philip A. Araman

Introduction

A series of five studies conducted by the Virginia Tech Department of Wood Science and Forest Products, in collaboration with the USDA – Forest Service (Blacksburg, Virginia), have tracked activity in the U.S. wood pallet and container industry between 1992 and 2006. The studies documented trends in wood use and pallet production within the industry, both new and recovered. This article focuses on the production of new pallets and the use of new wood materials. Pallet recovery, repair, reuse, and recycling activity will be described in a subsequent article.

Each of the five studies attempted to include all U.S. companies that were primarily or secondarily involved in the production of pallets and/or containers. The first four studies included all identifiable firms in Standard Industrial Classification (SIC) codes 2441 (wood boxes and shook), 2448 (wood pallets) and 2449 (wood containers not elsewhere classified). The most recent (2006) study utilized a slightly different definition of the industry due to the change by federal agencies from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS). The North American Industry Classification System superseded the SIC system and NAICS 321920 subsumed SIC 2441, 2448, and 2449 as well as 2429 (Special Product Sawmills, NEC) and 2499 (Wood Products, NEC). As a result, the two definitions of the industry differ slightly.

For a variety of reasons, not all firms provide data. Therefore, we estimated industry totals using the data collected and an independent measure of industry size, the number of employees as reported by the U.S. Department of Labor, Bureau of Labor Statistics. Estimates of the total number of employees in the industry

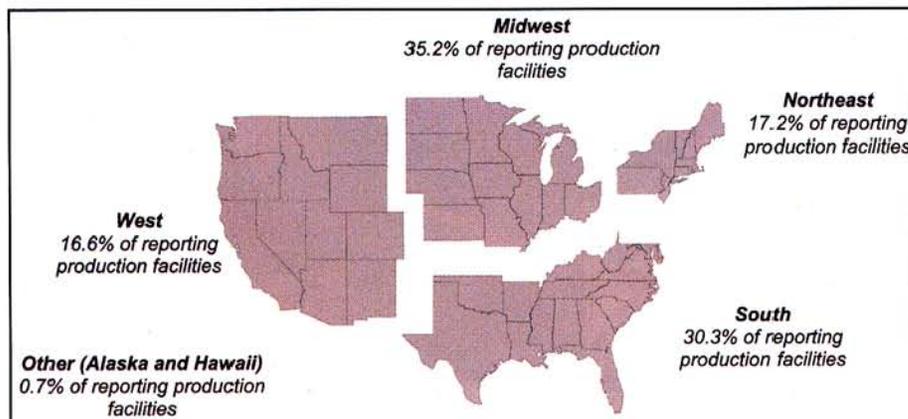


Figure 1. State Groupings Used in Regional Analysis

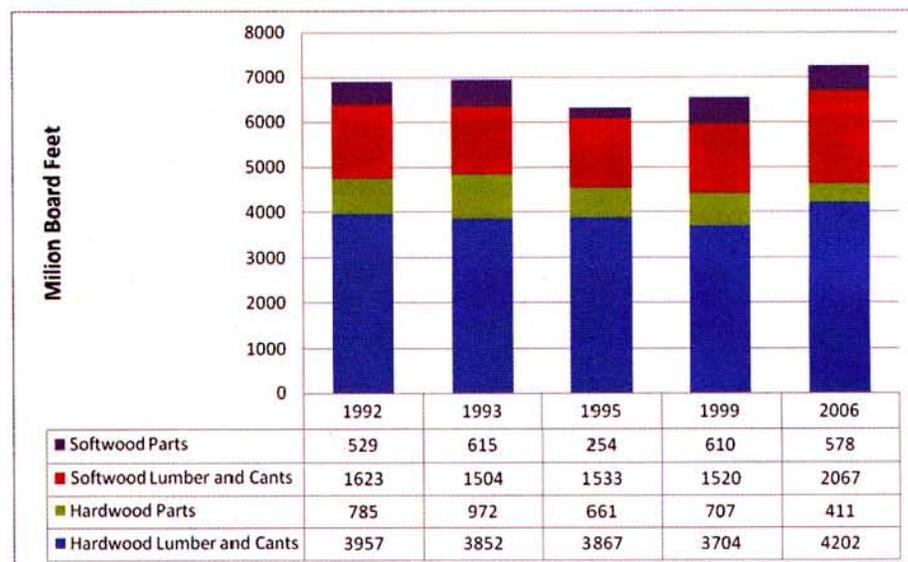


Figure 2. Estimates of New Wood Volumes Used by the United States Wood Pallet and Container Manufacturing Industry by Species and Form: 1992 to 2006 (Note that studies prior to 2006 included firms in Standard Industrial Classifications 2441, 2448, and 2449. The 2006 study included firms in North American Industry Classification System code 321920. The NAICS supersedes the SIC system. NAICS 321920 subsumes SIC 2441, 2448, and 2449 as well as 2429 and 2499.)

were thought to be more reliable than those of the number of firms participating in the industry and were used for this reason. Finally, please note that the most recent study reports activity in 2006, before much of the recent economic upheaval. Findings should be viewed in that context.

The Industry in 2006

Over 450 firms, representing over 590 production facilities, provided information about business activity in 2006. Fig-

ure 1 provides the regions used in the studies. Firms in the Midwest (35.2% of production facilities) and South (30.3% of production facilities) accounted for the majority of respondents.

Approximately 57 percent of the firms reported that new pallet production was their primary source of revenue in 2006. Recovered, repaired, and/or remanufactured pallets were the primary source of revenue for 25 percent of the firms. Regardless of the primary source

Species or Species Group	Use by Species (% of total reported volume)			
	West	Midwest	Northeast	South
Oak	8.9	19.7	8.8	35.0
Maple	0.0	6.1	11.9	2.7
Mixed Hardwoods (no species separation)	6.3	59.3	55.9	40.8
Other North American Hardwood Species	23.7	3.1	5.9	2.5
Spruce/Pine/Fir Species Group	13.2	6.9	3.5	3.2
Douglas-Fir	19.2	0.2	0.0	0.0
Southern Pine Species Group	0.5	3.2	4.8	15.4
Other North American Softwood Species	28.2	0.5	0.3	0.3
Species Imported from Outside of North America	0.0	1.1	9.0	0.1

Table 1. United States Wood Pallet and Container Manufacturing Industry Use of Lumber, Cants and Parts by Species or Species Group and Region: 2006

of revenue, over three-quarters of responding firms (78.3%) reported that they produced some new pallets and more than one-half (55.5%) were involved in pallet recovery, repair and/or remanufacturing.

On average, production of new pallets was 304,160 per firm in 2006 (note that this is per firm, not per production location). Approximately 21 percent of the pallets produced in 2006 were heat treated

by the manufacturer and fewer than one percent were fumigated. However, heat treatment or fumigation may occur after the manufacturer sells the pallet.

Over 70 percent of firms utilized hardwood lumber and/or cants in their operations and approximately 62 percent utilized some softwood lumber and cants. Overall, the industry used 63.6 percent (by volume) hardwood and 36.4 percent

softwood material in 2006 (Figure 2). This compares to an estimated 68.8 percent hardwood in 1992 and a high of 71.7 percent in 1995.

Within the hardwood category, 61.2 percent (by volume) of the lumber, cants, and parts used was of mixed species (i.e., no species separation) in 2006. The most commonly utilized single species was oak (26.9% of total hardwood use by volume). Maple accounted for 7.2 percent and other hardwood species accounted for 4.7 percent.

The southern pine species group accounted for 53.5 percent of softwood lumber, cant and part use in 2006. The spruce/pine/fir species group accounted for another 35.5 percent of use by volume and Douglas-fir use was 3.8 percent of softwood volume. Species (both hardwood and softwood) imported from outside of North America accounted for an estimated 2.3 percent of wood volume.

Table 1 provides our estimates of species use by region of the United States. As might be expected, wood species use differed by region. Firms in the South use the largest proportion of oak in their production operations while firms in the Northeast used the largest proportion of maple. The West was the only region in which firms did not use a large proportion of mixed hardwoods, relying instead on western hardwood species such as alder and on softwood species. Firms located in the Northeast used the largest proportion of species imported from outside of North America at 9 percent of their species mix by volume.

We estimate that the industry produced 441 million new pallets in 2006 (Figure 3). This level represents a modest 2.8 percent increase over estimated production of 429 million in 1999 and a 7.3 percent increase from production in 1995 (estimated to be 411 million units).

The majority of the estimated 441 million pallets produced in 2006 were of the stringer type. Multiple-use stringer pallets were 41.9 percent of total pallet production and limited-use stringer pallets accounted for 38.2 percent in 2006 (Table 2). Block pallets were approximately 6 percent of production while skids and other types of pallets accounted for approximately 14 percent of production. A variety of pallet sizes were produced in 2006, with 48 by 40 inches (26.9 percent of production) being the

most common single product (Table 3). A large percentage of production (49.8%) consisted of pallets of sizes not specifically listed in the study. This may reflect the customization of pallet specifications to individual customer needs.

We expected the production of 48 by 40 inch pallets to be a greater percentage of overall production because of the widespread use of GMA style pallets. However, we note that this pallet type is well supported by the recovery and repair industry. Supply from these firms may moderate demand for new 48 by 40 inch pallets.

Some regional differences in business activity were noted. Firms located in the western U.S. were more likely to list pallet recovery, repair, and/or remanufacturing as their primary source of revenue than were firm in other regions. The majority of firms relying on the production of pallet parts as their primary source of revenue were located in the Midwest. On average, firms located in the South were the largest in terms of new pallet production in 2006. Western and northeastern firms, on average, produced more recovered, repaired, or remanufactured pallets than new pallets. Firms in the South, West and Midwest heat treated between 22 and 24 percent of the pallets they produced while firms in the Northeast heat treated approximately 11 percent of pallet production. Few pallets were treated by manufacturers using fumigation in any of the regions.

Multiple-use stringer pallets were the largest proportion of regional pallet production in the West and the smallest proportion in the South. Block pallet production, while a relatively small proportion of production in all regions, was the least common among firms in the West. As compared to other regions, skids and other types of pallets were most commonly produced by firms in the South.

Industry Changes

Some changes to the questions used in the original 1992 study were made in subsequent studies. This was done to reflect information needs at the time, changing terminology, and issues of particular importance during the study period. As a result, not all information was tracked in each of the five studies. However, many questions were asked in all or most of the studies and these provide

Pallet Type	Production by Type (% based on number of units)	
	1999	2006
Limited-use block pallets	6.0	1.9
Multiple-use block pallets	5.7	4.0
Limited-use stringer pallets	37.7	38.2
Multiple-use stringer pallets	42.4	41.9
Skids and other types of pallets	8.2	13.9

Table 2. Types of New Wood Pallets Produced by the United States Wood Pallet and Container Manufacturing Industry: 1999 and 2006

Pallet Size	Production by Size (% of reported production based on number of units)	
	1999	2006
48 by 40 inches	26.9	
42 by 42 inches	4.8	
40 by 48 inches	5.3	
48 by 36 inches	1.5	
37 by 37 inches	1.6	
48 by 48 inches	4.3	
48 by 42 inches	3.7	
48 by 45 inches	2.1	
Other sizes	49.8	

* Respondents producing new pallets

Table 3. Sizes of New Wood Pallets Produced by the United States Wood Pallet and Container Manufacturing Industry: 2006*

some insight into industry change trends.

The species of lumber and cants used by firms in the pallet and container industry is an example of such trends. When comparing 2006 to 1992, it is evident that oak use has decreased from approximately 40 percent to 27 percent of the total volume of hardwood lumber, cants, and parts used. During the same time, mixed hardwood (no species separation) increased from 33.4 percent in 1992 to 61.2 percent in 2006. Among the softwood species, Douglas-fir use dropped dramatically (28.8 % of softwood lumber, cant, and part volume in 1992 to 3.8 % in 2006). Use of species in the southern pine group grew during all but one of the time periods covered by the studies, beginning at approximately 40 percent of softwood volume in 1992 and ending at approximately 54 percent in 2006.

Comparing 1999 to 2006, the proportion of total pallet production that consisted of block pallets decreased while the production of skids and other types of pallets increased (Table 2). The proportion of production that consisted of stringer pallets remained relatively unchanged. Between 1999 and 2006,

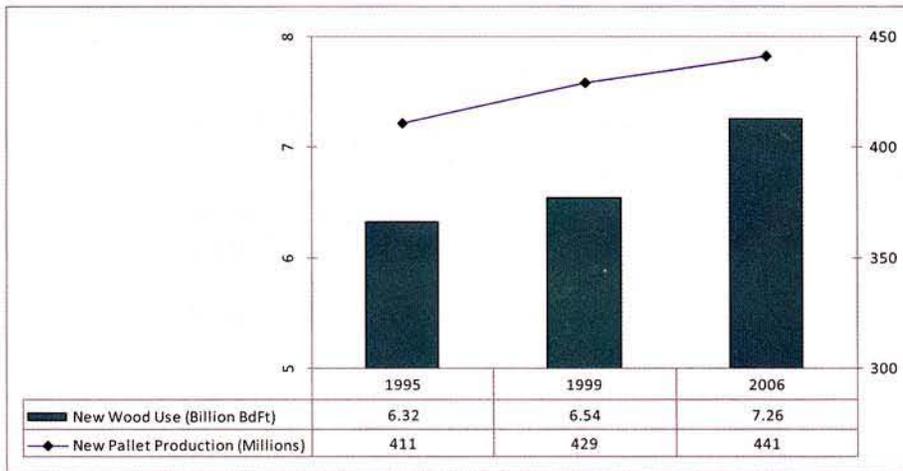


Figure 3. Estimates of New Wood Use and New Pallet Production by the United States Wood Pallet and Container Manufacturing Industry: 1995 to 2006 (Note that studies prior to 2006 included firms in Standard Industrial Classifications 2441, 2448, and 2449. The 2006 study included firms in North American Industry Classification System code 321920. The NAICS supersedes the SIC system. NAICS 321920 subsumes SIC 2441, 2448, and 2449 as well as 2429 and 2499.)

CHEP USA, a major buyer of block pallets, began producing them within the company. This change may have influenced the findings regarding block pallets as the organization did not participate in the 2006 study.

Figure 2 provides our estimates of the volumes of new wood materials (hardwood and softwood parts, lumber, and

cants) used by the U.S. pallet and container industry from 1992 to 2006. Total wood material use has increased over the period, even though use decreased between 1993 and 1995. We estimate that the industry used 6.89 billion board feet of lumber, cants, and parts in 1992. In 2006 this figure grew to 7.26 billion board feet. This growth in overall new

wood use reflects growth in the use of both hardwood and softwood lumber and cants. Also reflected is an increase in the use of softwood parts. The use of hardwood parts followed a different trend, decreasing between 1992 and 2006. The apparent move from hardwood to softwood parts may be due to a desire for dried material combined with a general decline in hardwood sawmill production and the resulting supply of hardwood parts.

While increases in new wood use are associated with increased pallet production (Figure 3), looking only at the use of new wood material can be misleading as it does not illustrate an important trend in the industry that occurred during the period of the studies – increased wood recovery and reuse. This activity will be described, along with a summary of total (new and recovered) wood use by the industry in a subsequent article. ■

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