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CHANGES AND TRENDS IN THE PALLET INDUSTRY

Editorial Note

HARDWOOD MARKET REPORT is pleased to present **"Changes and Trends in the Pallet Industry"** in this issue, the final of a three-part series. This paper was produced by **Robert J. Bush,** Associate Professor and Director, Center for Forest Products Marketing and Management, Department of Wood Science and Forest Products, Virginia Tech, Blacksburg, Virginia; **Philip A. Araman,** Project Leader, USDA - Forest Service, Southern Research Station, Blacksburg, Virginia; and was developed with the help of the personnel of the Northeastern Research Station, USDA - Forest Service, Princeton, WV. Funding and technical assistance for the research reported in this paper were provided by the Center for Forest Products Marketing and Management, Virginia Tech and by the Southern Research Station, USDA - Forest Service, Blacksburg, Virginia. **"Changes and Trends in the Pallet Industry"** is printed in the **HARDWOOD MARKET REPORT** with special permission from **Robert J. Bush, Ph.D.** Part three of the series, **"ALTERNATIVE MATERIALS AND INDUSTRY STRUCTURE",** begins on page 11.

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Changes and Trends in the Pallet Industry: Alternative Materials and Industry Structure

By: Robert J. Bush, Ph.D. and Philip A. Araman, MS

INTRODUCTION

In the first article of this three-part series we described trends in the use of new wood materials for pallets and containers. The second article described changes in pallet recovery and recycling. In this third article, we describe alternative (i.e., other than solid wood) materials used to manufacture pallets as well as changes in the structure of the industry. **Finally, we provide our predictions of how changes and trends will combine to impact the use of hardwoods.**

PART III: TRENDS IN THE USE OF ALTERNATIVE MATERIALS

As mentioned in the first part of this series, solid wood continues to claim the largest share of the pallet materials market. McCurdy and Phelps[1] studied several pallet using industries and found that, in all cases, **over 90 percent of the firms used solid wood pallets.** A recent article in **Pallet Talk[2],** a newsletter of the **NATIONAL WOODEN PALLET AND CONTAINER ASSOCIATION,** reported that only 15 percent of pallet users used any non-wood pallets. However, alternative material pallets such as those made from metal, wood composites, plastic and corrugated paperboard have increased their share in some markets and continue to generate interest among pallet purchasers. **Among these materials, plastic and corrugated paperboard hold the most potential to impact the use of solid wood.**

Plastic

In 1967, Dustin Hoffman as Ben Braddock in "The Graduate" was advised that his future was in "Plastics." **Just over thirty years later, many would say the same regarding the pallet industry. Indeed, plastic pallets are gaining favor in some market segments.** Plastic pallets are used by 20 percent of firms in the meat industry, 17 percent of firms in the food industry, and 12 percent of firms in the construction industry[1]. A study conducted in 19943 found that 22 percent of a sample of grocery distribution companies used plastic pallets and six percent predicted that they would discontinue the use of wood pallets by 1997. Thirty-seven percent of the companies predicted they would use plastic pallets in 1997. Plastic pallets enjoy perceived advantages in this important market with regards to quality, durability, cost per use, handling safety, and overall performance **(Figure 1).**

Plastic pallets are manufactured in a variety of designs and resin formulations, some of which include recovered plastic material. Some formulations are mixed with non-plastic materials such as wood fiber (e.g., sawdust or paper). The way in which plastic pallets are constructed also varies. Some mimic wood in that the plastic material is formed into "lumber" and used to construct stringers and deckboards. Other plastic pallets are manufactured by thermoforming sheets or by injection molding. The resulting pallets may be lighter than comparable wood pallets or, in a few cases, heavier.

Many plastic pallet designs are at a disadvantage when compared to wood on two important criteria: racking and purchase price (i.e., initial cost). Some designs are unable to hold an acceptable load at an acceptable deflection when supported along two edges (racking). Also,

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temperature dependent creep problems have been reported and may limit the ability to rack the pallet. The racking problem can and is being overcome with new designs and changes to racks.

The purchase price of some plastic pallets may be five times that of a comparable wood pallet. This disadvantage often limits plastic pallet use to systems where owners can maintain control of the pallet (e.g., the closed-loop from a grocery distributor to captive retail stores and back). In this setting, however, buyers may place more weight on cost per use - a criterion where plastic enjoys a perceived advantage because of high perceived durability.

Debating the merits of a particular design or resin formulation is to miss the major reason for the success of some plastic pallets; they are offered as part of a total product that meets all the needs of certain users better than do pallets of other materials.

The mistake made by some pallet manufacturers is believing that the needs they serve begin and end with supporting and protecting a load. Some pallet manufacturers (plastic and wood) have recognized that customer needs go beyond this point. These manufacturers may offer buyback at a specific price to eliminate the need for a customer to dispose of pallets. They may offer a warranty covering broken pallets and they may offer financing of pallet purchases. These manufacturers emphasize the recyclability of the product to serve the buyer's need for a socially acceptable and low disposal cost product. They provide pallets that nest (fit together to facilitate storage), meet tight dimensional tolerances so that the pallet will work consistently in automated handling systems, and they may produce a pallet that is lighter than is typical - reducing stress on employees who must lift the pallet. **Successful pallet manufacturers view their product as a service to the customer rather than a thing onto which product is loaded and into which forklift tines are placed.** An investigation of wood containers reported in a recent issue of **Pallet Talk**[4] summarized this point well: **"Its about product marketing, not product composition."**

Corrugated Paperboard

Successful plastic pallet designs have found a niche at the high end of the market. In contrast, corrugated paperboard pallets are developing a niche at the low end where purchase price and reduced disposal problems are important. Accordingly, corrugated pallets are most often found in open-loop systems (i.e., systems where the pallet purchaser does not maintain possession and control of the pallet). McCurdy and Phelps[1] found that fiber (corrugated) pallets were used by 24 percent of firms in the health / pharmaceuticals industry, six percent of firms in the construction industry, and four percent of firms in the food industry. Engle[3] found that 0.5 percent of grocery distributors used corrugated pallets for shipping dry goods in 1994.

Corrugated paperboard is most often used to construct relatively light weight pallets and, consequently, they enjoy a perceived advantage in handling safety (Figure 1). Their primary advantage, **however, is that they greatly reduce disposal and recycling problems.** Users of pallets such as grocery retailers do not wish to become involved in the pallet business. Their ideal pallet would appear with minimal cost when needed and disappear without effort or cost when not needed. Corrugated pallets come closer than wood to achieving this ideal as they can be placed into existing, and often well established, corrugated recycling systems. **Corrugated paperboard is the single most recovered type of paper-both in tons and in terms of the percentage of generation.**[5]

As with plastic, it is misleading to debate the merits of corrugated paperboard versus solid wood as pallet materials; each have advantages and disadvantages. Such a debate focuses people on the materials and the real reason for the success of corrugated in some markets has little to do with load carrying capability. **Corrugated pallets**

provide a <u>total</u> package of benefits that fits the needs of certain users better than do wood pallets.

Changes in the Industry

The pallet industry in 1998 is quite dynamic, Pallet recycling is growing, new manufacturing businesses are entering with alternative materials, mergers and acquisitions are taking place, and strategic alliances are forming. At the same time, industry groups are striving to standardize quality through programs such as **NWPCA's Certified Pallet Repair (CPR).** In this dynamic environment, third party management companies have changed the way in which the industry does business. **The term third party management is applied to organizations which lease, rent and / or manage pools of pallets.** Examples include Chep U.S.A. (arguably the leader in this group) and National Pallet Leasing.

As mentioned, often users of pallets wish to avoid, as much as is possible, dealing with pallets. Third party management programs serve this need by providing pallets to users at a fee. Since the user does not own the pallet, the need to dispose of or repair it is eliminated, as is the accompanying cost. Instead, users pay a known and predictable cost and, in doing so, reduce their perceived risk.

Third party management has brought to the industry large companies with the financial resources needed to offer or switch to pallets of alternative materials. For example, Chep U.S.A. maintains softwood pallets in Europe and has produced softwood and softwood/hardwood combination pallets for use in the U.S. The company has experimented with plastic pallets and already promotes plastic containers. Since Chep U.S.A. contracts with manufacturers to have pallets produced, they have the ability to shift relatively easily to alternative materials. Because of the large number of pallets Chep U.S.A. controls, a switch by this company could have a large effect on hardwood use for pallets. The effect would be magnified if other companies followed Chep's move to alternative materials.

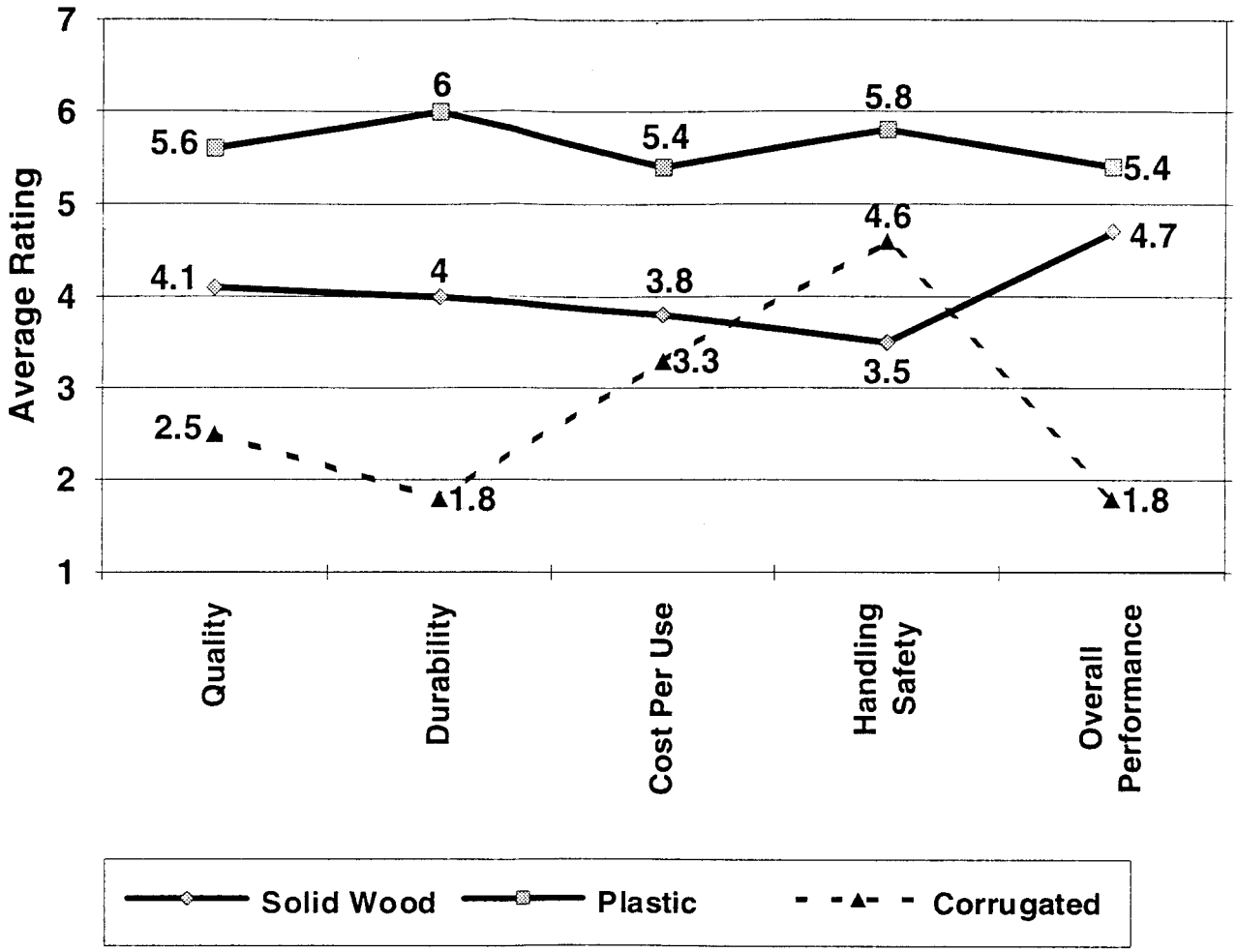
Third party managed pallets are generally high-quality. **The trend toward higher quality pallets and toward more multiple-use and fewer limited-use or disposable pallets could reduce the demand for hardwoods as higher wood content is offset by increased life.** Also, such pallets are more likely to be repaired and reused.

Other changes in the industry may affect hardwood use; however, the direction of change is not always clear. Increased standardization (if it occurs) will lead to efficiencies which are likely to decrease hardwood demand. Company consolidation will result in fewer family owned businesses with "sawdust in their veins" and **more companies which see themselves as providers of materials handling solutions rather than wood pallet 'manufacturers.** Finally, the public's aversion to "cutting down a tree" for such a "lowly" product as a pallet may shift production to non-solid wood and non-wood materials, even if the environmental impact of using these products is no better than that of wood.

Conclusions

The pallet market remains in transition. Some trends may be dead ends and others may affect the use of hardwoods in ways that cannot yet be predicted. Our data series (as reported in the first two articles of this series) is short and, as such, unreliable for long-term predictions. **Our best guess, however, is that the use of new hardwood material for pallets will decline (although not rapidly) as a result of increased pallet recovery and alternative materials. Such a decline will result in greater availability of lower grade hardwoods for markets such as flooring, railway ties, and possibly furniture. Whether these markets will be able to utilize the extra material is unknown and will, as always, depend on economics.**

Figure 1. Perceptions of Pallets Made from Various Materials (Data represent the average scores reported by buyers in the GROCERY DISTRIBUTION INDUSTRY on a seven-point scale where "1" was unfavorable and "7" favorable. Source: Engle et al. 1994)



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