

# THE PALLET INDUSTRY IN THE SOUTHERN UNITED STATES

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## ABSTRACT

Pallet manufacturers in the southern United States were surveyed to study the overall structure of the industry in this region. A number of issues were studied, including production, raw materials, marketing, and training needs. A majority of respondents were located in four states: Tennessee, Georgia, North Carolina, and Virginia. Labor and resource procurement were of greatest concern regarding future expansion. Two-thirds of respondents planned on increasing their workforce in 1999 and 45 percent planned to do so in the period 2000 to 2005. Generally, respondents' sales are intrastate; however, respondents most often cited diversity of markets as the reason for sales outside the company's home state. Oak was the most used species, followed by other hardwoods and southern pine.

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Pallet production contributes considerably to the use of sawnwood in the United States and is a primary consumer of hardwoods (6,19). In southern states, pallet manufacturers also use large quantities of softwood resources, since production of rapidly grown pine species yield relatively large and inexpensive quantities of desirable softwood raw materials.

Studies of the pallet industry are numerous. Some have focused on analyses and characterizations of the entire U.S. pallet industry (6,15,17), while others analyzed specific functions of the nation's pallet industry, such as raw material use (4,17). One study conducted in 1980 pointed out that the pallet industry was largely responsible for the growth in wood products use through the 1970s, with continued growth reliant on new innovations and technologies in palletization (18). Garrahan et al. (12) identified potential marketing challenges for producers of wood pallet bins used by fruit and vegetable processors.

McCurdy et al. (17) used national studies conducted in 1982 and 1985 to

estimate wood volumes and types used in pallet production in the United States. They found that on average 13.43 board feet (BF) per pallet were used in 1982, while 13.89 BF per pallet were used in 1985. These numbers varied, however, according to whether or not the sample was divided into expendable and non-expendable pallets. They also found that, nationally, 73 percent of the lumber used in pallet production originated from hardwood resources.

The pallet industry faces challenges if it is to remain competitive in the future. Previous research has determined that raw material availability and quality, regulatory impacts, and waste disposal are issues of utmost concern to the industry (10,19).

State-level studies have been conducted in various locales (10,11,13,19), usually with objectives such as determining the structure of the state's pallet industry, estimating the volumes of species consumed in production processes, and providing information for policymakers and educators.

Fraser et al. (11) surveyed pallet manufacturers in Pennsylvania in 1986 in order to characterize that industry's state presence. They used their findings to compare against a previous national study, finding some discrepancies in number and average size of firms in Pennsylvania. However, findings were similar for other data, such as estimates of wood use, production, and average number of years in business. Wood use per pallet in Pennsylvania was reported as lower by this study (16.2 BF per pallet) than for the Middle Atlantic region (16.8 BF per pallet), as reported by McCurdy et al. (17).

Smith (19) surveyed Washington state pallet manufacturers in 1990 to ascertain industry structure in terms of size, raw material use, investment strategies, and factors impacting competitive position. Smith pointed out that the Washington state pallet industry differs considerably from the industry existing in the eastern United States because of its

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TABLE 1. — Response rates by state.

State	No. of surveys mailed	Undeliverable	No. of responses	Adjusted response rate (%)
Alabama	64	19	12	27
Arkansas	27	7	6	30
Florida	60	20	10	25
Georgia	103	32	25	35
Louisiana	21	5	2	13
Mississippi	47	15	11	34
North Carolina	82	22	17	28
South Carolina	42	9	11	33
Tennessee	107	23	37	44
Virginia	46	13	15	45
Total	599	165	146	34

substantial softwood resource. Also, long distances separating metropolitan areas place transportation cost limitations on the industry. He found that environmental issues, along with supply restrictions in the northwestern United States, could have significant impacts on Washington's pallet industry. He further found that producers in the state tended to focus on short-run production issues rather than long-run issues such as marketing, education, employee turnover, and other economic factors.

Pallet producers in Ohio were surveyed in 1991 (10). The objectives of that study were to determine industry size and structure, industry concerns, and to gather information potentially to be used in environmental policy analysis. Among other findings, researchers estimated the volume of lumber consumed for the entire Ohio pallet industry was approximately 470 million board feet (MMBF) in 1991. Survey respondents ranked worker's compensation, safety, health and other regulatory issues, as well as environmental regulation as their most important concerns.

Michael (13) researched the Texas pallet industry through mail and facsimile surveys. He found that the industry had a significant economic impact on the state, employing more than 1,700 people and providing greater than \$20 million in wages. He estimated industry production in Texas to be approximately 32 million units, totaling over \$200 million in sales.

Bush and Araman (3) researched and reported on changes and trends in the pallet industry. They found that consumption of both hardwood and soft-

wood solid wood used in the production of pallets and containers in the United States declined during the period 1993 to 1995, from 4.82 billion board feet (BBF) (pallets) and 2.12 BBF (containers) to 4.53 BBF (pallets) and 1.79 BBF (containers). These data indicate that the use of recycled materials is becoming more prominent in the industry. They further found that a large portion of pallet material processed at landfills was ground and used for such things as bedding, compost, soil amendments, and fuel (4). They also found that substitute products such as plastic pallet designs are not able to "rack" (to hold an acceptable load at an acceptable deflection when supported along two edges (5)) properly or sufficiently. Further, plastic pallets may be cost prohibitive when compared to wood pallets.

The southern states have a well-established pallet industry that faces challenges to remain competitive. Research for the southern United States has not been fully explored in the past. Therefore, in spring of 1999, research and extension faculty at the Louisiana State University Agricultural Center conducted a survey of pallet manufacturers in 11 southern states. The purpose of the survey was to characterize the industry in the South. Information collected in this study can provide market and industry structure information to existing and potential pallet producers in the region.

#### METHODS

A census of pallet manufacturers was drawn from the 1999 PhoneDisk Power-Finder CDROM directory (7). A mail survey was sent to manufacturers in 11 states: Arkansas, Louisiana, Mis-

issippi, Tennessee, Alabama, Georgia, Florida, South Carolina, North Carolina, Kentucky, and Virginia. Survey development and implementation followed methods and procedures recommended by Dillman (8) and described as the Total Design Method (TDM). Accordingly, mail questionnaire procedures included pre-testing, pre-survey notification of the initial mailing, a post-survey reminder, and a second survey mailing.

#### RESULTS

Of the 599 surveys mailed, 165 were returned as undeliverable. Therefore, the survey population was 434 facilities. Of these, 146 completed and returned the survey for an adjusted response rate of 34 percent. Table 1 shows response rates by state.

Nonresponse bias was measured by using a two-tailed t-test conducted on percent of companies by state, comparing respondents and companies that fell into the nonresponse/undeliverable category. No difference in state distribution was detected at  $\alpha = 0.05$ . In addition, research has shown that late respondents typically respond similarly to nonrespondents. Accordingly, second mailing respondents, as a proxy for nonrespondents, were compared to first mailing respondents by state of origin (9). In this case as well, no difference in state distribution was detected at  $\alpha = 0.05$ . Because *a priori* information on company size or sales was not available, nonresponse bias tests were not conducted on these factors.

Respondents are skewed to larger companies with over 58 percent having 1998 sales of \$1 million or more (Fig. 1). Nine percent of respondents reported sales of less than \$250,000.

#### RAW MATERIALS

Of the raw materials used in pallet production in the southern United States, the majority consumed are hardwoods (77.6%) as opposed to pine (22.4%). The average volume utilized per respondent in 1998 was 1,206 thousand board feet (MBF) of oak species, 1,373 MBF of other hardwood species, and 579 MBF of pine species. The resource utilization mix for southern pallet manufacturers conforms to Marten's (14) findings for resource use by the national pallet industry as a whole (80% hardwoods, 20% softwoods), but differs from Bush and Araman's (3) findings of

almost 30 percent utilization of softwoods. Further, this differs from Michael's (13) findings for Texas pallet producers. In Texas, it was found that resource use was split evenly between hardwoods and softwoods, with pine being the predominant species used. It is likely that fluctuations in local and regional markets may contribute to these variations between locales and between different points in time.

When asked about their sources of raw materials, most respondents (63%) stated that they received their wood inputs directly from sawmills. Another 24 percent stated that their wood material came from their own facilities, while brokers/wholesalers provided another 13 percent.

Pallet recovery and recycling, though not a new phenomenon, has grown in importance in recent years, to the point that now the National Wooden Pallet and Container Association states that recycling is the most profitable sector of the pallet industry (4). In our survey, 34 percent of respondents use recycled materials in pallet production. Of those that use recycled materials, the ratio of recycled materials used in the overall consumption of wood inputs was 55 percent, on average. The use of recycled materials can be important in reducing landfill waste materials. For example, Brickner (2) stated that pallets comprise 19 percent of estimated woodwaste input materials. Another issue related to woodwaste is the method of disposal for pallet manufacturers. Just over a third of

respondents are able to sell their production waste, while 18.1 percent of respondents give it away. This indicates that there is an opportunity to profit from pallet production waste. In addition, 13.2 percent use waste for fuel, and 12.6 percent of respondents haul waste to landfills.

Many of the survey respondents do not rely solely on raw material resources from the state in which they reside. Many (63%) obtain raw materials from other states. However, nearly all respondents (96%) stated that their raw materials came from within the United States.

### BUSINESS ISSUES

Respondents mainly sell their products within their own state. Respondents stated that, on average, 82 percent of their total sales were to buyers within their own states. Seventeen percent of total sales, on average, were to buyers outside of their home states but within the United States. Almost 2 percent of sales, on average, were made to international buyers. When asked why they sold outside their home state, a majority of respondents (53%) stated that they desire diversity in their markets. Some respondents (20%) stated that their in-state customers could not accept all their production volume, while another 20 percent stated that they could get higher prices elsewhere. Fewer stated that it was easier to conduct business with interstate customers (4%), or that in-state customers did not prefer their products (2%). Ninety-two percent of respondents sell their products directly to their customers, while 7 percent use distributors.

In terms of product marketing, 9.5 percent of respondents claim to have a specific marketing budget, while 8.4 percent of respondents rated marketing skills as being very important to their success. Respondents rated word of mouth, the use of sales representatives, and distributor support as more important promotion tools than the use of various media (radio ads, newspaper ads, catalogs, magazine ads, or trade magazine ads) for advertising their products.

Pallet manufacturers were able to identify key reasons for company success, including such customer-related issues as long-term customer relationships, company reputation, product quality, and customer service (Fig. 2).

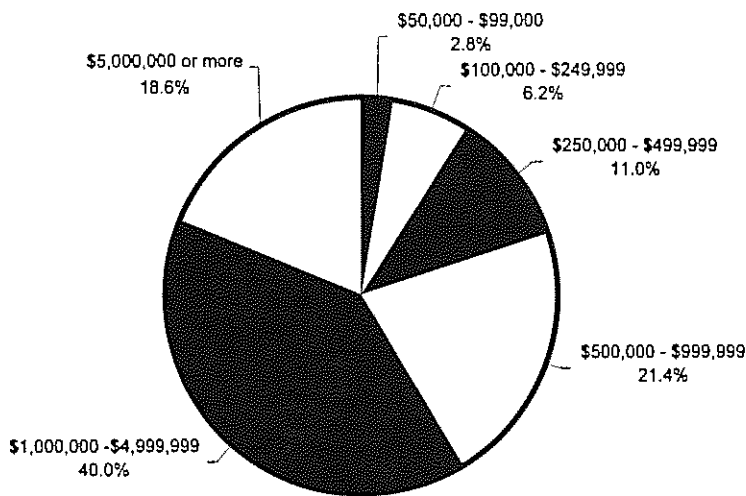


Figure 1. — Respondent company size (1998 annual sales) (n = 146).

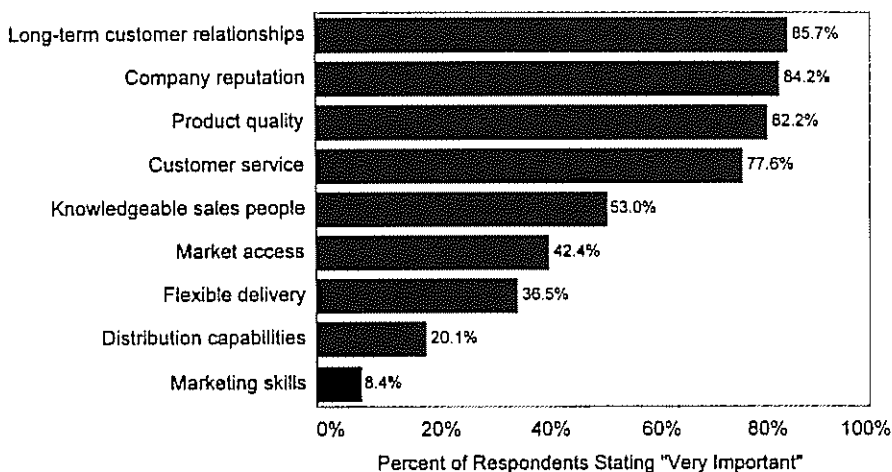


Figure 2. — Reasons for success (n = 146).

Survey participants were also asked to single out the top future challenge to company success (Fig. 3). The challenge of most concern was the procurement of consistent raw materials (59% of respondents answered "strongly agree"), followed closely by the procurement of quality raw materials (57.9% answered "strongly agree"). Product demand was also deemed important (17.3%), as well as finding qualified employees (12%), government regulations (8.7%), and wood material cost (8.7%). Some potential challenges that were not deemed as important were wood decay (0.7%), product standards (0.7%), and foreign competition (0.7%).

Participants were asked the importance of a variety of factors that might lead to their company expanding its production capacity. Figure 4 presents these factors, ranked by mean values. Note that the issues of foremost concern to southern pallet manufacturers center around the traditional production inputs: labor, capital, and raw materials. Respondent manufacturers consistently list productivity, costs, and availability as significant labor factors; available capital and bank financing as significant capital factors; and proximity to raw materials as a significant input cost factor. They are more concerned about local input (labor, capital, and raw materials) markets than regional or national input markets. These factors suggest that southern pallet manufacturers are fairly localized with respect to their cost inputs and are, therefore, heavily dependent upon local economic conditions much more than on regional, national, or international economic conditions. Therefore, opportunities may exist within the pallet industry to improve financial viability extensively through increased transportation efficiencies or through the incorporation of a better-educated and motivated workforce (if available).

Information needs of the pallet industry were also examined. As was discussed earlier, labor productivity, often a function of training, was found to be an issue among respondents. Manufacturers often suffer from a mismatch between the skills their workers have and the ones they must acquire for the company to survive and grow. Many companies will not open new facilities or expand existing ones if they find the local labor force incapable of staffing and ser-

ving facilities or operating production lines (1).

Plant owners and managers must respond to new, often unexpected, and substantially different demands for job skills. Training, therefore, assumes an increasingly important role in manufacturing modernization strategies.

In addition to production labor issues, information needs have implications for training and development programs across many levels and functions in an organization. Figure 5 presents information needs as ranked by survey participants. Information topics were ranked between marginally desired (2.0 on a

3-point scale) and most desired (1.0 on the same scale). Information on how to reduce costs ranked highest, followed by employee relations and motivation. Other desirable information included the areas of processing efficiencies, government regulations, workman's compensation, quality control, and marketing.

#### SUMMARY AND CONCLUSIONS

The pallet industry is one of the most competitive in the United States, with its ease of entry and exit into the marketplace and volatility. Pallet manufacturers in the southern United States have legitimate concerns regarding future viability. The ability to recruit and main-

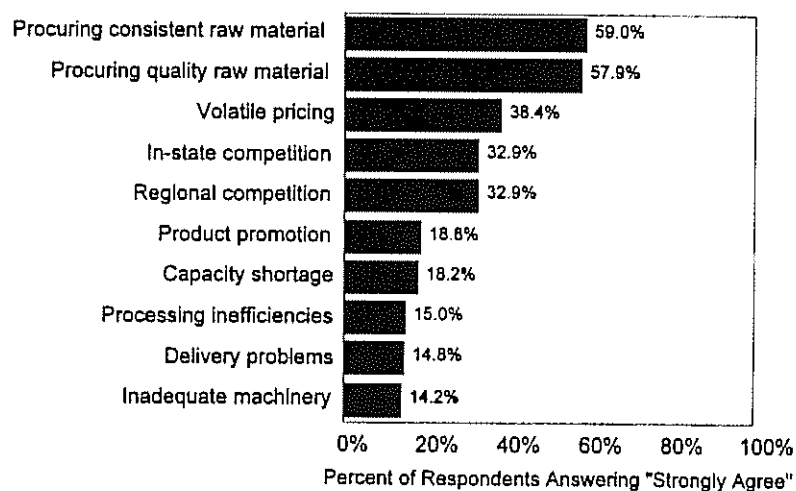


Figure 3. — Challenges to company success ( $n = 146$ ).

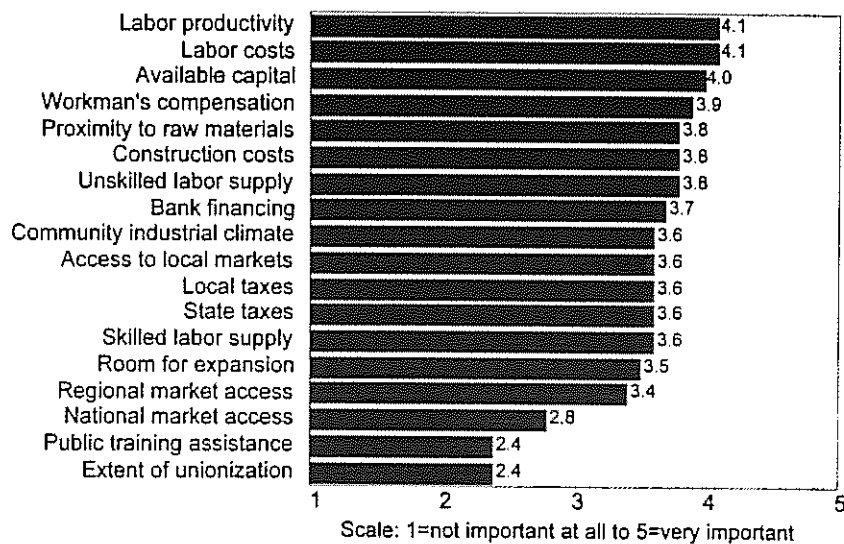


Figure 4. — Importance of factors that would lead to expansion of capacity; mean values ( $n = 146$ ).

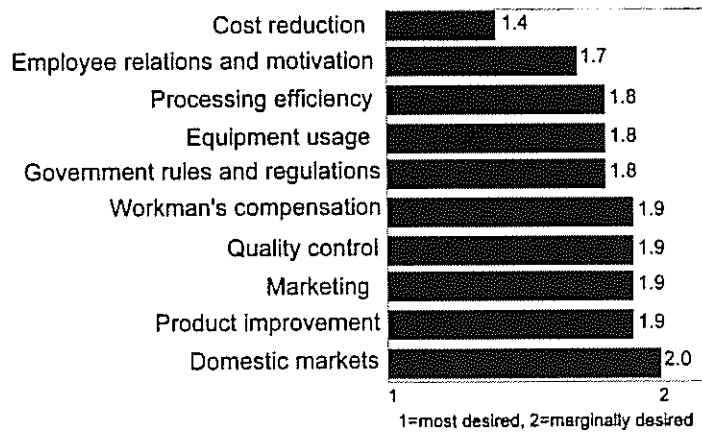


Figure 5.— Top 10 topics for which respondents would like more information; mean values ( $n = 146$ ).

tain a quality workforce, as well as motivating that workforce, are challenges the industry will face well into the future. Other labor-related factors, such as workers' compensation requirements and rates, also concern pallet producers. Economic factors such as product demand, the ability to raise capital for expansion of existing facilities or development of new facilities, taxes, and regulatory environments will also determine the extent to which the industry will flourish in the next decade. Wood resource issues will continue to be at the forefront of industry concern.

Marketing strategies could be further developed within the pallet industry to diversify markets and attract new business beyond local markets that have sustained southern pallet manufacturers. Cost reduction in the form of transportation efficiencies and production management systems designed to reduce both transportation and inventory costs could enable pallet manufacturers to better capitalize on new regional markets that have previously been unavailable. New innovations in materials use, recycling capabilities, and transportation/storage would also benefit the in-

dustry in developing new markets and potentially increasing sales.

Despite these challenges, the pallet industry is prepared to expand and adapt to an ever-changing marketplace in the 21st century. Producers expect to hire more employees in the next 5 years. They also expect to purchase more equipment, particularly equipment that will help them produce pallets more efficiently and utilize recycled material. This information, combined with concerns regarding labor and capital, leads one to the conclusion that the industry, as a whole, is optimistic about future growth opportunities, as long as there is a viable workforce and the financial capital available to capitalize on expanding or emerging markets. If these challenges are adequately met, the pallet industry will continue to be a viable member of the industrial community in the South, providing those states with highly desirable value-added revenue.

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