

Fewer Pallets Reaching Landfills, More Are Processed for Recovery

Study Suggests There May Be Opportunities for Pallet Recyclers to Partner with Landfills

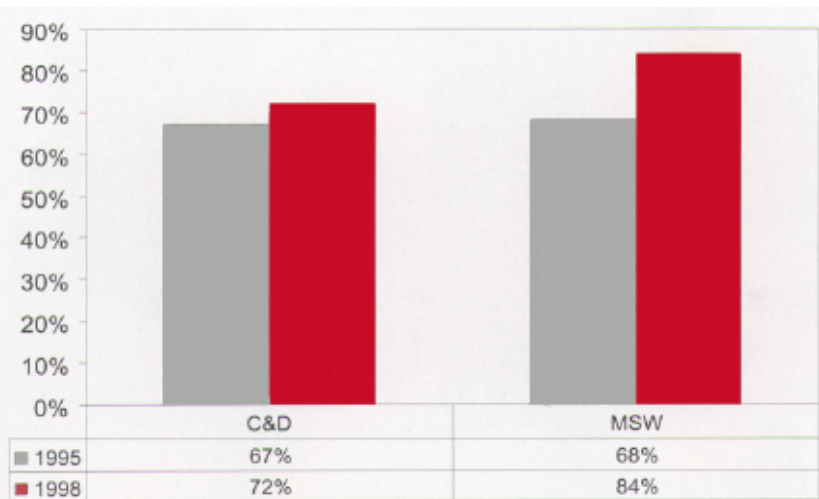


Figure 1. Estimated Percentage of Construction/Demolition Debris and Municipal Solid Waste Landfills that Accept Wood Pallets for Disposal: 1995 and 1998

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With more and more pallet recyclers seeking used wood pallets, it is a wonder that pallets ever reach landfills. In fact, the pallet industry utilizes many discarded pallets, and recovery is increasing.

The Virginia Tech Center for Forest Products Marketing and Management estimates that the pallet industry received 171 million pallets in 1995 (containing 2.6 billion board feet of wood) for the purpose of reuse and recycling. We estimate that this figure grew to just short of 300 million pallets in 1999. This means that over one-third of the material used for pallets during 1999 was recovered. In 1995, the proportion of recovered material was closer to one-quarter of total solid wood use.

While pallet recovery is increasing, pallets still find their way to landfills. Typically, pallets are sent to landfills because of damage, location, or lack of knowledge. The pallet may be damaged beyond repair (at least economically feasible repair) and therefore placed in the waste stream by pallet users. A serviceable pallet's final destination may be a location where there are no facilities for recovery and no market for cores. Finally, pallets may be discarded because the user has no knowledge of markets or recycling alternatives.

Regardless of the reason, many pallets eventually become "trash."

Ever wonder what happens to these pallets? We did and, in 1996, we set out to find answers. We first reviewed information available from the U.S. Environmental Protection Agency. Unfortunately, EPA information did not provide the level of detail we were seeking. As a result, we decided to conduct our own study. Our study included all state licensed Municipal Solid Waste (MSW) and Construction/Demolition debris (C&D) landfills in the U. S. (excluding those in Alaska and Hawaii).

The results, reported previously in *Pallet Enterprise*, showed that not all pallets going to MSW and C&D facilities were actually put in the landfill. Some were recycled and some were re-used as pallets. Perhaps of most interest to the pallet industry was the finding that landfills might be grinding cores that could be reused. In other words, landfills could be a source of repairable pallets and usable pallet parts.

However, the pallet industry is quite dynamic, and pallet recovery is likely to have changed since our last study. So, in order to stay up-to-date, we repeated our study. This article provides some of the findings of our latest study and highlights changes between 1995 and 1998. We found several changes that could affect the pallet industry.

What We Studied

As with the previous study, our latest work included all state licensed Municipal Solid Waste (MSW) and Construction/Demolition (C&D) debris landfills in the U. S. (excluding Alaska and Hawaii). According to the EPA, municipal solid waste "refers to wastes such as durable goods, nondurable goods, containers and packaging, food scraps, yard trimmings, and miscellaneous inorganic wastes from residential, commercial, institutional and industrial sources, such as appliances, automobile tires, old newspapers, clothing, disposable tableware, office and classroom paper, *wood pallets*, and cafeteria wastes" (emphasis added by authors). Construction/Demolition debris refers to waste that is "generated during the construction, remodeling, repair, or demolition of buildings, bridges, pavements, and other structures." C&D debris includes (again according to the U.S. EPA) materials such as concrete, asphalt, lumber, steel, carpet, glass, and tree stumps. Be-

cause construction materials are sometimes shipped on pallets (e.g., bricks, cement mix, etc.), pallets are often found in C&D debris. We believe that these two types of facilities account for most of the pallets reaching landfills in the U. S.

Using listings obtained from 48 state landfill-licensing agencies, we identified 1,800 MSW landfills and 1,230 C&D landfills. Each of these was contacted to determine the number of pallets arriving at their facility and the fate of these pallets.

Questions Answered

As with many industries, the waste disposal industry is consolidating. We found that there were fewer MSW and C&D facilities in 1998 than in 1995. The facilities that remained accepted more waste on average than did their counterparts in 1995. The average amount of waste received at MSW facilities in 1998 was 138,000 tons (compared to 103,000 tons in 1995), while C&D facilities received an average of 36,000 tons (compared to 29,000 tons in 1995). However, the actual volume of solid waste going to landfills declined.

Our previous study suggested a trend

toward banning pallets from landfills in some parts of the country. This trend does not appear to have continued nationwide. In fact, the reverse occurred. Approximately 84% of MSW landfills and 72% of C&D landfills accepted wood pallets for disposal in 1998. Compared to 1995, these figures represent increases among both types of landfills (See Figure 1).

On average, pallets represented 2.8% of mixed waste at MSW facilities and 3.3% at C&D facilities in 1998 (on a weight basis). Compared to 1995, these figures represent an increase for MSW facilities (from 1.5%) but no significant change for C&D facilities.

In spite of the increase at MSW facilities in the proportion of waste that was pallets, the total number of pallets received by landfills (MSW and C&D, combined) decreased. Approximately 138 million pallets reached MSW facilities and 40 million reached C&D facilities in 1998 for a total of 178 million pallets. This compares to approximately 185 million pallets in 1995.

What happens to pallets arriving at landfills? Not surprisingly, many are landfilled. The surprise is that many are

not. We found that 33% of MSW and 27% of C&D landfill operations had the ability to recover wood pallets in 1998. In comparison, 18% of C&D landfills had the ability to recover plastics, 35% could recover concrete, and 54% could recover certain metals. Twelve percent of the MSW landfills that did not recover wood pallets planned to begin doing so within two years.

At both C&D and MSW landfills, approximately 24% of the wood recovered in 1998 was from pallets. Landfills encourage the recovery of wood (including pallets) by offering lower tipping (disposal) fees for sorted loads. For example, at MSW landfills operating recovery facilities, the national average fee for putting pallets in the landfill was approximately \$29 per ton. Among the same group, the average tipping fee for pallets at the wood recovery facility was approximately \$23 per ton.

Recovery facilities at MSW landfills processed 22 million pallets in 1998 while C&D-based recovery facilities processed approximately 16 million pallets for a total of 38 million pallets processed in 1998. Figure 2 illustrates our estimates of

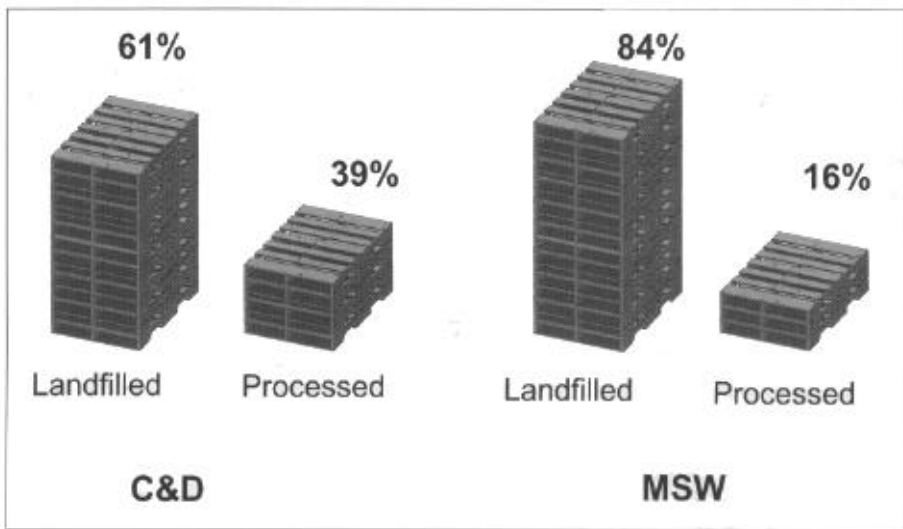


Figure 2. Estimated Proportion of Pallets Processed for Recovery at Landfill Wood Recovery Facilities and Proportion Landfilled: 1998

the overall pallet recovery and disposal (landfill) rates at landfills during 1998.

The recovery rate at C&D landfills increased between 1995 and 1998, while recovery at MSW facilities remained steady.

Most wood pallets recovered at landfill operations are used to produce products other than pallets. For example, at C&D facilities approximately 53% are

ground or chipped. Typical uses for this material included animal bedding, mulch, and compost as well as landfill cover and fuel. The pallets that were not ground were used for fuel, sold as-is for use as a pallet, and (infrequently) repaired on-site (see Figure 3).

At MSW landfills, the pallet recovery picture changed between 1995 and 1998.

Larger proportions of the incoming pallets were separated for reuse as-is, repaired at the recovery facility, ground for landfill cover, and ground for mulch. Conversely, use of incoming pallets for fuel (solid or ground) decreased. At C&D facilities, larger proportions of the incoming pallets were ground for landfill cover and smaller proportions were ground for fuel.

On average, MSW facilities selling ground pallet material for non-fuel uses received \$20 per ton. C&D facilities sold the same material for an average of \$22 per ton. It is likely that mulch sales affected these figures as many landfill recovery operations appear to have discovered a strong market for mulch products. Moreover, these prices may be inflated by sales of colored mulch. Recovered pallets sold for an average of \$1.51 at MSW facilities.

Implications

The results described above indicate a trend toward improved utilization of wood pallets at landfills. Fewer pallets are reaching landfills (in spite of high pallet production levels) and an increas-

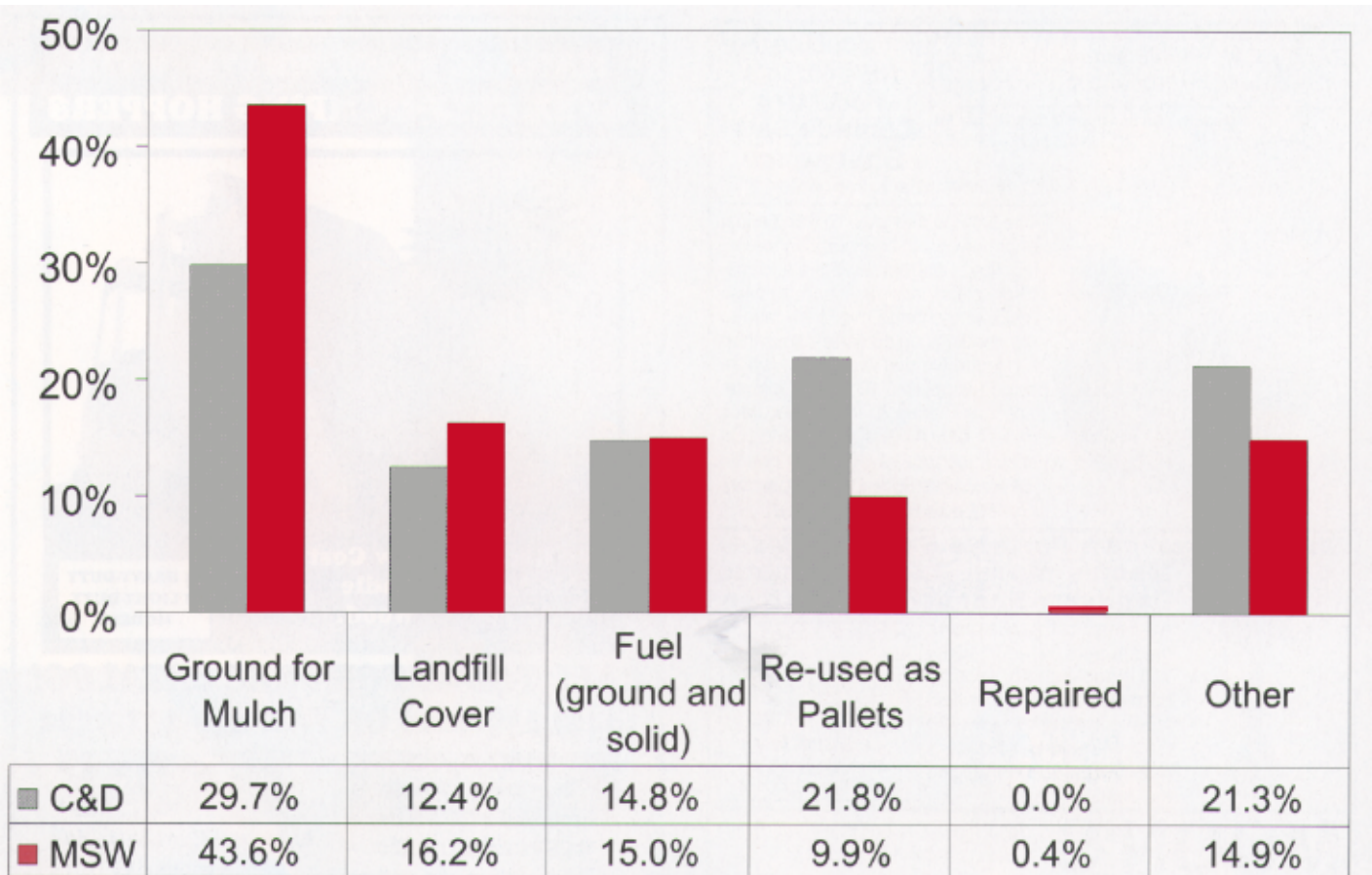


Figure 3.

Estimated Use of Pallets at Construction/Demolition Debris and Municipal Solid Waste Landfill Wood Recovery Facilities: 1998

Program Analyzes, Tests Pallet Recovery Scenarios

PROACT is a spreadsheet-based business program that can be used to plan and virtually test the economic feasibility of pallet recovery operations. The program is flexible, and inputs can be changed to test different scenarios or better match particular situations. PROACT should be particularly useful in evaluating the disassembly of pallets at landfills to recover usable parts.

PROACT may be obtained from Phil Araman by e-mailing him at paraman@vt.edu or mailing your request to 1650 Ramble Road, Blacksburg, Virginia, 24061

ing proportion of those that do are processed for recovery. Also, results suggest opportunities for pallet recyclers.

The finding that fewer pallets are reaching landfills, with increased levels of pallet production, suggests increased recovery and repair by firms in the pallet industry. Moreover, pallet users may be contributing to this trend by maintaining pallets for longer life cycles. In 1995, there appeared to be a trend toward more landfills refusing to accept pallets. As mentioned above, exactly the opposite happened.

A likely reason is that pallets (along

with other “organic” materials) are readily recoverable and helpful to landfill operators in reaching target waste recovery rates. When recovery at landfills is combined with recovery by the pallet industry, the resulting relatively high overall level is good news for an industry that has experienced public scrutiny of its environmental record.

The opportunity identified by this study involves the current relatively low-value uses for recovered pallets at landfills. Grinding is a quick and efficient way to deal with pallets but may not recover the maximum value. As a result,

many reusable pallets are being ground. While these pallets contain parts that could be reused, most landfill operators are not interested in entering the pallet repair business. Collaboration between pallet recovery companies and landfills could provide opportunities for both parties; the pallet company would have access to a source of used parts and repairable cores while the landfill could increase reuse rates and recovery value. In addition, some pallet companies may find opportunity in marketing mulch for landfills or providing grinding or mulch-coloring services

(Editor's Note: Robert Bush is associate professor of forest products marketing at Virginia Tech. Daryl Corr is a recent M.S. graduate now employed by TBM Hardwoods. Philip Araman is project leader with the U.S. Forest Service and an adjunct member of the Virginia Tech faculty. The research on which this paper is based was supported by the USDA-Forest Service, Southern Research Station and the Center for Forest Products Marketing and Management.)

