
What's Stopping the Recycling of Recovered CCA-Treated Lumber

*Robert Smith, Delton Alderman, Jr.,
and Philip Araman*

Abstract

The awareness and concerns regarding the environmental impacts and disposal of chromated copper arsenate (CCA) treated wood products are increasing. Several investigators predict that the quantities of CCA-treated lumber will increase significantly in the upcoming decades. Additionally, with the number of landfills decreasing, landfill tipping fees increasing, and limitations being placed on the types of materials which can be landfilled, it is vital that treated wood currently directed to landfills be recycled.

Introduction

The primary goal of this project was to identify factors which will assist decision-making in the reduction of the quantities of chromated copper arsenate (CCA)-treated lumber directed to our private and public landfills. Ultimately this will have an effect in three principal areas: 1) conservation of both public and private softwood forests, 2) reduc-

ing the area of public and private land utilized for landfills, and 3) new economic opportunities via the creation of recycling businesses. The objectives were:

1. categorize and quantify southern yellow pine CCA-treated lumber being taken out of service from residential decks in North Carolina, South Carolina, and Georgia,
2. identify perceived barriers and incentives to recovery, and
3. present recommendations to improve the recycling of CCA lumber.

Sample Frame and Data Collection

Contractors involved in the fabrication, demolition, and deconstruction of residential decks were the population of interest for this study. The contractors sampled for this research were from Georgia, North Carolina, and South Carolina. The sample frame was obtained from the American Business Disc 2000 (2). A total of 2,833 questionnaires were mailed to randomly selected members from the sample frame. The primary data collection tool was a self-elicitation mail survey questionnaire. The mail survey and sequencing were modeled after Dillman's *Total Design Method* (1). A prenotification letter was mailed first followed by three mailings of the mail survey questionnaires. Reminder postcards were also mailed.

Results and Discussion

Of the questionnaires mailed, 681 were returned as undeliverable or refused. Undeliverable

Smith:

Associate Professor and Extension Specialist, Center for Forest Products Marketing and Management, Dept. of Wood Science and Forest Products, Virginia Polytechnic Institute and State University, Blacksburg, VA

Alderman, Jr.:

Research Scientist, USDA Forest Service, Northeastern Experiment Station, Princeton, WV

Araman:

Project Leader, USDA Forest Service, Southeastern Research Station, Blacksburg, VA

questionnaires included contractors that had gone out of business, contractors that moved without a forwarding address, or contractors that had an expired forwarding address. Three respondents refused the final mail survey questionnaire packet, and 10 companies requested by phone or by letter to be removed from the study. This resulted in a total of 2,139 contractors as potential respondents. In total, 580 questionnaires were returned. The first question asked the respondent if their company fabricated decks. One hundred and eighty respondents answered No, and Yes was checked by 400 respondents. The total adjusted response rate of 20 percent was calculated by subtracting the bad addresses from the mailing total and dividing it into the usable responses.

The mean number of decks built per respondent in 1999 was 31, and the average size of the decks was approximately 272 ft.². The average number of decks demolished in 1999 was 8 per respondent, and the decks averaged about 198 ft.² per deck. The increase in the mean size of a deck should be encouraging news to the producers of treated lumber. Respondents indicated that nearly 35 percent of decks are either built or remodeled by the homeowner. Finally, over 7 percent of the lumber purchased to construct a deck resulted in discards or scraps.

To obtain the treated lumber materials and quantities contained in a deck, Lowe'sTM Project Design System was utilized. The quantity of CCA-treated southern yellow pine (SYP) lumber removed from service in 1999 in the selected states and the total quantity of lumber removed from deck demolition in the United States were determined by using the average deck size, the estimated board footage contained in a deck, the average number of decks removed per respondent, the sample frame and national population estimates, and the percentage of decks built by the homeowner. The average deck demolished in 1999 was approximately 198 ft.². In order to estimate the lumber required in a deck, we used the dimensions of 12 by 16 ft., which results in a deck that contains 6 ft.² less than the average reported demolished deck. The treated lumber required for a 192 ft.² deck was estimated to be 1,057 board feet (full sawn).

Respondents were asked questions concerning the costs associated with deck fabrication and demolition. The importance of these questions lies in

the fact that financial incentives could be developed to encourage the recovery of used lumber. The average disposal cost reported by the respondents was nearly \$180 per deck. The respondents were asked to estimate the additional cost for dismantling a deck for recovery rather than demolishing the deck. The average cost for deck deconstruction was more than two times the estimated cost for demolishing a deck, nearly \$371 per deck. Regarding the percentage of treated lumber that could be potentially recovered, it was found that over 44 percent could be recovered. The mean percentage of lumber reported being recovered from dismantling a deck was over 51 percent.

Rating questions (1 to 7) were asked to gain an understanding of the factors concerning deck replacement. The highest rated factor for deck replacement was decayed wood at 5.3. This was followed by aesthetics and was rated 5.2. Third, the physical degradation of the wood components was rated at 5.1. Safety, or a structurally unsound deck, was the next highest factor rated for deck replacement, followed by homeowners preferring a larger sized deck. Other reasons for deck replacement, in order of importance, were poor construction, a new deck style preferred, insect infested wood, and finally, a new material was preferred.

Data were collected on the primary disposal methods and the facilities to which contractors directed their used lumber. Concerning the primary method of disposal contractors' used, 289 reported they disposed of used lumber in municipal solid waste landfills (MSW). Of this total, 179 respondents used MSW facilities exclusively. Additionally, 32 directed disposals to MSW landfills more than 90 percent of the time. Construction and demolition facilities (C&D) were used by 48 respondents, and 21 respondents directed their used lumber to C&D facilities exclusively. Fifty-one replied that they disposed of spent CCA lumber at private facilities.

Spent lumber was recovered for reuse by 64 respondents (15%), and one respondent indicated that they recovered all of their used lumber for reuse. Six respondents indicated that they reused the material more than 90 percent of the time. Contract disposal was utilized by 35 respondents, and 15 respondents used other disposal methods. Other disposal methods included using the recovered lumber to build deer stands, reused it in the home, disposed of it in a dumpster, the homeowner

gave it away, contractors buried it, or they gave it away. Fifty-two respondents reported burning used lumber as their primary or alternative disposal method. The burning of treated lumber is prohibited and is detailed on the consumer information sheet that is given to buyers at the time of purchase.

Contractors were asked to rate on a scale from 1 to 7, factors that impede the recycling of CCA-treated lumber. These factors include time, cost, a lack of recovery facilities, recovery programs in place to assist a contractor, the manpower to dismantle, and equipment. Not surprisingly, a "lack of recycling facilities" was rated the highest at 6.2. This was followed closely by a "lack of recycling programs," which had a mean rating of 6.1. The costs associated for dismantling a deck was the third highest rated factor at 5.7. The next highest rated factor was time, followed by manpower and equipment. Health risk was the lowest rated factor. Most salient are the factors "lack of recycling facilities" and "lack of recycling programs" which indicates that recovery programs and centers will have to be developed and built in order to facilitate the recovery and recycling of used CCA-treated lumber.

Qualitative Question Results

Next the respondents were asked two open-ended questions. The first queried the respondents for their opinion regarding what incentives or programs could be instituted or developed to initiate the recovery and recycling of spent CCA-treated lumber. Respondents offered 321 ideas or opinions on possible initiatives for the recovery of spent CCA lumber. The category with the greatest number of responses concerned financial incentives being offered to facilitate the recovery of used CCA lumber and over 40 percent reported that some type of financial incentive should be offered. This was followed by elimination of tipping fees or incentives could be based on weight. Payment for recovery, tax breaks, retailer discounts, and penalties or fines should be incorporated to initiate recovery.

The establishment of recovery facilities was the next most frequently reported response. Nearly 70 percent of the respondents indicated that recovery centers needed to be developed and easy access to those facilities should be available to contractors. This was followed by the establishment of separate areas in the landfill and business entities estab-

lishing the recovery centers. The establishment of recovery programs was the next category at 11.2 percent. The most frequently reported option was the development of a buyback program, followed by the establishment of industry or government pickup programs, development of a county government recovery program, building association program, and local governments contracting with builders. Several respondents indicated that public education programs needed to be developed, nearly 9 percent.

Participants were next asked to offer their opinion on the types of products that could be produced from spent CCA-treated lumber. It should be noted that the following results are reflections and actual responses of the study participants. Neither Virginia Tech, the Department of Wood Science and Forest Products at Virginia Tech, or the USDA Forest Service endorses or recommends any of the following recommendations, uses, or products for spent CCA lumber. The most frequently reported response was to utilize spent CCA-treated lumber to manufacture some type of engineered wood product (32.0%). The use of CCA-treated lumber for outdoor home applications was the next category at 24 percent. Frequently mentioned responses were to manufacture landscape borders, lawn furniture, playground structures, fencing materials, flower planters, lattice, pickets, birdhouses and feeders, tree houses, screen doors, gables and vents, or in the repair of porches. The manufacture of miscellaneous wood products from spent CCA-treated lumber was next (21.8%). Stakes, forming materials, other lumber products, firewood logs, posts, non-visible support structures, mudsills, baller boards, artwork, spindles, parking stops, signs, crawl space lumber, deer stands, mats, and use the material for sub-flooring were reported. The manufacture of decking and decking related materials were mentioned in 11.4 percent of the responses. This included the fabrication of small decks, walkways, stair treads, and for use in docks. The next product category was processed materials (7.8%).

Conclusion

The average size of decks is increasing, as the average size of a demolished deck was nearly 198 ft.² and a new deck contained approximately 280 ft.². The estimated age of decks was nearly 13 years at removal; this is notably higher than found in previous research. From data analysis and ex-

trapolation, the estimate is nearly 67.5 million board feet of SYP-CCA lumber removed from the demolition of decks in the sample states. The national estimate of lumber removal (from decks) was over 1 billion board feet in 1999. When observing the results from the lumber recovery importance factors, the most striking results are a “lack of recycling programs” and a “lack of recycling facilities.” It should be self-evident that programs and facilities will have to be developed to make the recovery of treated lumber a viable option. Responses to the qualitative question regarding initiatives to facilitate recovery supported the findings of the lumber recovery importance factors. The largest percentage of responses indicated that financial incentives should be instituted, followed by recovery facilities. The results of this research indicate that the cost of dismantling a deck, finan-

cial incentives, recovery programs and facilities, and a promotional campaign to address the benefits of recycling, all are important factors and issues with the contractor. For the recovery of treated lumber to become a viable alternative to disposal, it is vitally important that we fully understand what contractors will need to begin the recovery-of discarded CCA-treated lumber. Understanding these needs will benefit the producers of southern yellow pine, the treating industry, consumers, municipalities, and our forests.

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Enhancing the Durability of Lumber and Engineered Wood Products

*February 11–13, 2002
Radisson Resort Parkway
Kissimmee (Orlando), Florida*

*The conference was sponsored by the Forest Products Society
with sponsorship support from APA–The Engineered Wood Association;
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Janssen Pharmaceutica; J.H. Baxter & Company; Lonza Group;
Osmose, Inc.; Troy Corporation; Trus Joist, A Weyerhaeuser Business;
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Forest Products Society
2801 Marshall Court
Madison, WI 53705-2295
phone: 608-231-1361
fax: 608-231-2152
www.forestprod.org