

which probably coincided with a period of peak adult emergence from adjacent pine plantations. Low numbers of the bark beetle *Hylurgus ligniperda* were recovered initially but presumably failed to compete for the available food supply with the growing *Arhopalus* populations. Although *Arhopalus* larvae are effective wood-borers, the preferred feeding zone was in the nutrient rich subcortical area (Hosking and Hutcheson 1979). This study also confirmed work by Hosking and Bain (1977) who reported that entry into the wood was only after the subcortical area was depleted. Wood-boring commenced some time between 40 and 90 days after oviposition and was initially confined to the slab-wood zone of a saw log. Only after 120 days were larvae found penetrating deeper than 10mm.

*Arhopalus* adults were adept at finding and gaining entry to the wood through very small zones of damaged cambium/phloem. Fire damaged stands can often grow with apparent good health for several years and then suffer heavy breakage due to insect infestations at the time of the fire. Hosking and Bain (1977) reported heavy wind breakage at all of their study sites 12 to 14 months after initial attack.

Wood-stain associated with the insect activity proved to be the main wood degrade factor and was found to be predominantly associated with insect damage. In this study the majority of wood degrade from both insect activity and wood-stain occurred in the lower two metres of the stem which effectively accounts for the most valuable section of the bottom log.

The presence of a green crown and live subcortical tissue on a tree weeks or even months after being damaged by fire should not be used as an indicator of future survival and good health. Unless a fire is of very low intensity an early decision should be made to salvage or 'write-off' damaged trees.

In the event of a pine plantation fire during the *Arhopalus* flight period from November – April, adult beetles will immediately be attracted to damaged trees and early salvage will be needed to maximise the value of standing timber. Ideally trees should be processed within six weeks of a fire, as after eight to ten weeks wood-stain becomes a problem. Trees damaged by fire outside the main flight period may well have their recovery period extended to the following summer although this could not be confirmed in the present study.

### Acknowledgements

Gordon Hosking for his comments on the paper and Andrew Blakie and Mark Twaddle for their assistance with the field assessments.

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# Making Your Mark: The Use of Branding in New Zealand Forest Products

Hugh Bigsby and Lucie Ozanne<sup>1</sup>

### Abstract

*The paper presents the results of a study of the use of branding by New Zealand lumber manufacturers. The study found that in general, as the volume and value of firm's output increases, the amount and variety of product identification and branding used increases. Product identification and branding were most commonly linked to legal requirements for some types of labelling, or because protective packaging provides a cheap opportunity to use brands. Large firms (>15000m<sup>3</sup> p.a.) also use brands to identify superior product characteristics, as a method to assure quality, to encourage repeat purchasing, and a high proportion believe that branding adds value to the product they market. Large firms are the only ones to report using bar coding on sawn timber, possibly reflecting the need for greater control in inventory management.*

### Introduction

New Zealand is one of a number of nations or regions in which the forest products industry has developed around a plantation-based resource. As a result of past planting programmes, wood supply in New Zealand is expanding, and over the next 15 years the plantation resource will be able to almost double to 32 million m<sup>3</sup> (Ministry of Forestry 1996). Because domestic wood consumption is anticipated to grow only slowly and requirements are anticipated to be less than 8 million m<sup>3</sup> per annum (Horgan and Maplesden 1995), new markets for this expanded production will have to be developed. Part the development of new markets will depend on marketing activities by forest products producers, of which a key component will be product differentiation. Product differentiation involves developing consumer awareness of product characteristics which distinguish one producer's product from another's (Schnaars 1991). With New Zealand's products being built around plantations, and being based on a resource which is 93% radiata pine, two areas of differentiation are provided for producers.

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The first area of differentiation is provided by the species, radiata pine. The production and use of radiata pine is uncommon outside a few other countries, with the only other major producers being Australia and Chile. The restricted supply provides an opportunity for radiata pine producers to market their product as being something different than other softwood species. The second area of differentiation is the use of plantations. Most other countries derive their forest products from natural forests which are tied up with a range of environmental and multiple use management issues. Many new plantations are established on ex-farmland, and as a result, have little of the environmental baggage associated with natural forests. In some cases, the establishment of plantations leads to environmental improvement as degraded farmland is stabilised under a tree crop. Producers of forest products from plantation are thus in a position to differentiate their products from those which come from natural forests, and producers may be able to promote their products as being the output of a sustainably managed plantation forest.

In addition, to differentiating itself from non-radiata and pine non-plantation based producers, New Zealand may also be able to differentiate itself from other radiata pine producers. Although both Australia and Chile have tree breeding programmes, and in Chile many stands are pruned, New Zealand is possibly more advanced in this research. Active research programmes for radiata pine have led to New Zealand-specific characteristics which provide a contrast to other regions which grow radiata pine. These characteristics include the refinement of genetic stock and plantation management practices, in particular pruning regimes which are directed towards clearwood products. They also include processing developments in areas such as sawing, drying, hardening, and grading technologies, which have contributed to adding value to this resource. The differences in plantation management practices, and processing strategies may give New Zealand radiata pine producers a competitive advantage over other radiata pine producers that could be exploited in the marketplace. As such, it might be appropriate for New Zealand-grown radiata pine to be differentiated in a way which identifies the product as arising from New Zealand's own particular management and processing system.

The factors of being based on the perceived sustainable management of radiata pine, and New Zealand specific product characteristics, provide opportunities for product differentiation. One important avenue for exploiting product differentiation is through branding (Schnaars 1991). There are no previous empirical studies that specifically look at the application of branding to forest products. However, there are a number of forest products companies who are using this product strategy, such as Fletcher Challenge Forests who recently introduced the Origin brand. In general terms though, a brand is a name, term, symbol, design, or combination of these factors that identifies the seller's goods and services, and distinguishes them from competitors' products (Bennett 1988). The aim of a brand is generally to convey information on, or persuade the consumer about, the quality, reliability, social status, value for money or safety of a product (Bowbrick 1992). A range of advantages arising from branding have been identified (Kotler 1994, Bennett 1988, Sinclair 1992). These include:

- Distinguish product from competitor's;
- Opportunity to attract a loyal set of customers;
- Potential market segmentation tool;
- Encourage repeat purchases by reducing price comparisons;
- Provide legal protection to unique product features;
- Help build the corporate image;
- Easier to process orders and track problems.

In the context of the New Zealand forest products industry, the

first four of these advantages would provide the most logical reasons for the adoption of branding. The combination of plantation-based, radiata pine forestry and rapidly expanding harvest, all of which must be exported, should provide both a basis and a motivation for the forest products sector to develop branding strategies. While there is some evidence of branding becoming an important factor for New Zealand forest products producers (Bigsby 1997), there have been no studies of how and where branding is being used. The purpose of this paper is to address this problem by presenting and discussing the results of a survey of lumber producers in New Zealand on their use of product branding.

## Methodology

A survey of lumber producers in New Zealand was conducted in early 1996. The sample was drawn from a listing of 65 sawmilling firms in the New Zealand Forest Industries Directory. Data was collected using a mail survey based on the Total Design Method (Dillman 1978). The response rate from the survey was 30%.

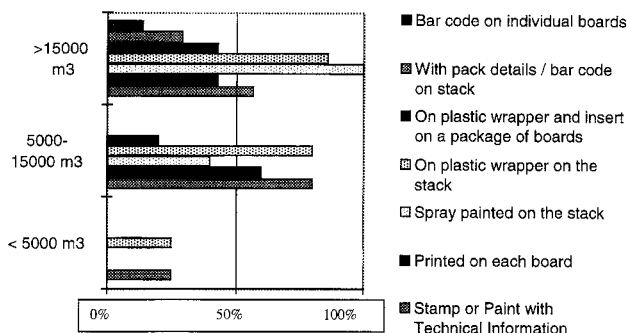
For the purposes of this study, branding was considered to be either a brand name for a specific product, or the use of the company's name on a product. Either of these approaches offer some or all of the potential gains from branding discussed previously, and the focus of the study is on where and how branding is used rather than the brand per se. Firms have many different opportunities to establish a brand, ranging from relatively inexpensive labelling with company names to very expensive branding programmes. In this study, different types of branding were grouped according to where and how the branding would appear. The types of branding which were used in the survey were as follows:

- Stamp or paint with technical information
- Brand or company name printed on each board
- Brand or company name spray painted on the stack
- Brand or company name on plastic wrapper on stack
- Brand or company name on plastic wrapper and insert on a package of boards
- Attached label with brand or company name or packet details and bar code on the stack
- Brand or company name with bar codes on individual boards

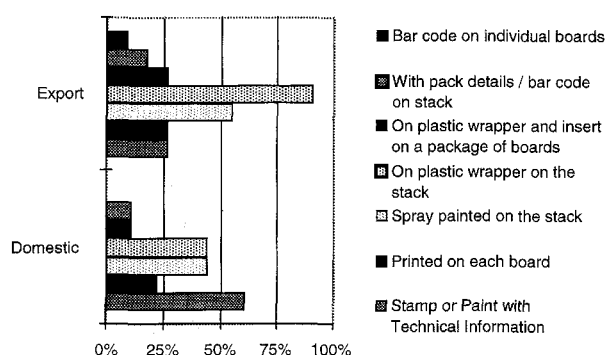
## Results

Company size has a marked effect on the use of branding (Figure 1). For small companies, or those with an annual output of less than 5,000 m<sup>3</sup> and turnover of \$5 million or less, there was limited use of branding. The most common use of branding for small companies was in conjunction with other labelling which was necessary to meet legal requirements. Legally required informa-

**Figure 1**  
Use of Brand or Company Name by Company Size



**Figure 2**  
**Type of Product Identification by Market**



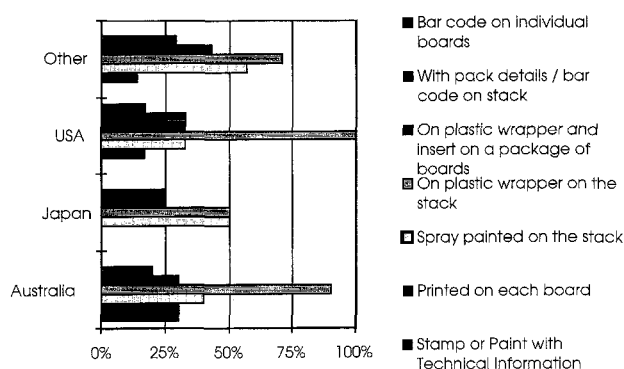
tion includes technical information about timber preservatives, and framing grades for structural timber. Only 25% of small firms used branding in conjunction with technical requirements. A brand or company name on the stack wrapper was also used by 25% of small firms. The limited use of product identification may be a reflection of limited firm resources, restricting the company's ability to promote a brand.

For medium sized companies, or those with an annual output of between 5,000 and 15,000 m<sup>3</sup> per annum, the use of branding expanded from technical information, to include company name or brand on boards, stacks, and wrappers. All firms in this category also used product identification to meet legal requirements. The types of product identification used were primarily associated with technical information, which was combined with the use of a brand or company name on each board, the pack, or on the pack wrapper. In addition to legal requirements, companies begin to brand for reasons of quality assurance, repeat purchasing and because packaging provides an inexpensive opportunity to use brands.

For large firms, or those with an annual output of greater than 15,000 m<sup>3</sup>, more types of branding were used and more of the companies used a wide variety of branding. Most of the firms in this category have total company output of greater than \$12.5 million. These firms probably possess large enough resources to promote a brand name, such that it becomes widely recognised, and thus assists consumer decision making. Large companies use all of the types of product identification, with the brand or company name on the stack or wrapper being most widely used. A lower proportion of the large firms provide technical information, perhaps reflecting the production of componentry and millwork by some of these firms. Large firms are the only ones which use bar coding on sawn timber, possibly reflecting the need for greater control in inventory management, and the use of such capabilities that may have been developed in other areas of the firm. The majority of large firms use product identification for quality assurance, to encourage repeat purchasing, and to identify superior product characteristics, as well as to meet legal requirements. A high proportion (67%) the large companies believe that branding adds value to products.

Differences in the use of branding can also be found on the basis of end markets rather than company size. Figure 2 contrasts the use of branding in domestic and export markets. The use of a brand name on plastic wraps on timber packs, or spray-painted on timber packs was the most common form of branding in either market, although the use of plastic wraps in the export market is almost double that of the domestic market. In export markets there is generally a greater use of product identification, including the use of bar coding. This is possibly linked to exports having a greater value added content in comparison to products sold

**Figure 3**  
**Type of Product Identification by Country**



in domestic markets. In domestic markets there is much greater emphasis on provision of technical information on sawn timber. This is likely due to larger volumes of framing and treated timber being sold in the domestic market.

Domestic markets can be divided into structural and non structural markets for the purposes of branding. Structural markets are those in which building materials are required to meet building codes for structural properties. Non- structural markets are those in which the products are used either for appearance, such as furniture or panels, or for landscaping and fencing. In structural markets, the most common form of branding is in association with technical information. In this case, branding is used to meet legal requirements for identifying framing grades or preservative treatment (against borer). The use of brand names on packaging such as stack wrapping is also found, but was generally seen as simply a cheap opportunity to use brand names. In the furniture and panels non-structural timber markets the most common branding is in the form of a brand or company name on a stack or stack wrapper. The use of branding in this market is to identify superior product characteristics and to encourage repeat purchasing. In the landscaping market, branding was done in conjunction with technical requirements for identifying timber treatment. In either domestic market there is little use of bar coding.

A detailed look at export markets shows that the greatest variety of branding use is in the U.S. and Australian markets (Figure 3). For New Zealand, the U.S. and Australia are also markets with the highest value-added or most processed sales. The Australian market, which has a similar radiata pine-based construction system, imports large volumes of framing material and preservative treated timber. In spite of the higher value-added, branding in the Australian market is still largely associated with the of provision technical information. The lumber market in the U.S. is mainly for mouldings and components for manufacturing. The only reported use of bar coding corresponds to sales that go directly into U.S. retail markets. As a contrast, the Japanese market has imported much lower value and more semi-processed lumber products, and as a result there is a more limited use of branding.

### Summary

In general, the number of different types of branding used increase as the size of the company increases, and a greater proportion of companies take advantage of branding opportunities. As companies become larger the reasons for using branding focus on more of the traditional marketing reasons for branding. Only the largest companies indicated that a reason for branding their products was that branded products were valued more.

The most common type of product identification in export markets is the brand or company name on the protective wrap-

per on a stack of timber. This was mostly used by firms exporting greater than 25% of their output. There is also generally a greater emphasis in export markets on the use of branding to encourage repeat purchasing and to identify superior product characteristics. The differences in the use of branding based on company size are mostly revealed in export rather than domestic markets. For companies exporting more than 50% of their output, product identification was considered to be important for encouraging repeat purchasing, while for companies exporting less than 25% of their output, branding was considered to be important largely to provide technical information and meet legal requirements.

In spite of the potential for using branding to differentiate lumber products, the survey shows that branding is used in only a limited way. This points to a greater potential for branding, and the accompanying marketing strategies, to have a place in developing markets for New Zealand producers.

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# Indigenous Biodiversity Conservation and Plantation Forestry: Options for the future

David A. Norton\*\*

## Abstract

*Our goals in plantation forests should be to integrate production and protection in the same landscape (as advocated by the Resource Management Act 1991) rather than replacing one with the other. A review of indigenous biodiversity in New Zealand's plantation forests shows that many indigenous plants and animals occur in exotic plantations, with the number of species being dependent on plantation age, proximity to indigenous remnants and a variety of site factors (slope, aspect, etc). Plantation forests contribute to the conservation of indigenous biodiversity through: (i) providing habitat for indigenous species; (ii) buffering indigenous forest remnants; and (iii) improving connectivity between remnants. Options for enhancing indigenous biodiversity conservation in plantation forests include: (i) retention of indigenous forest; (ii) establishing a greater diversity of planted species; (iii) planting a diversity of tree species along streams and roads to provide additional habitat for indigenous animals; and (iv) modifying silvicultural practices within plantations. It is suggested that through the use of spatial modelling, optimisation of the*

*arrangement of different aged compartments, and different plantation species, will maximise both timber production and indigenous biodiversity within a forest thus allowing full integration of these two activities without the loss of production values.*

## Introduction

There has been considerable debate in New Zealand about the relationship between plantation forestry and indigenous biodiversity conservation.<sup>1</sup> This has been fuelled in part by the recent Greenpeace report (Rosoman 1994) but also by a growing national and international interest in biodiversity conservation. While there has been some useful contributions to this debate (O'Loughlin 1995, Spellerberg and Sawyer 1995, Perley 1996) others have largely missed the point (Sutton 1995, Purey-Cust 1996) seeing biodiversity conservation as simply a threat to plantation forestry without any positive values. In this article I argue that biodiversity conservation does not need to threaten plantation forestry and that we can achieve both production and some conservation goals in the same forest.

The historical land-use paradigm in New Zealand sees two, mutually exclusive, land-use options, preservation and production<sup>2</sup> as highlighted by the Reserves Act 1977. This perspective, intentionally or unintentionally, underlies the New Zealand Forest Accord (August 1991) and subsequent Principles (December 1995). While recognising that both indigenous biodiversity conservation and plantation forestry have important roles to play in New Zealand, the Accord seeks to effectively separate production from biodiversity conservation (Potton 1994, Sutton 1995, Dyck 1997), viewing plantation forests as crops that do not need to meet biodiversity conservation goals (Sutton 1995, Dyck 1997).

This polarisation of production and conservation is, however,

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<sup>1</sup> Biodiversity is defined in Article 2 of the 1992 Biodiversity Convention as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems". For the purposes of this article I use biodiversity to refer to the diversity of species indigenous to New Zealand.

<sup>2</sup> I use the word production throughout this article to refer to land-uses that directly utilise natural resources for commercial gain such as agriculture and forestry.