

# RESEARCH AND DEVELOPMENT – A MARKETABLE COMMODITY

John A. Butcher \*

## Introduction

Research and development expertise in forestry and wood products is concentrated at the Forest Research Institute (FRI). This expertise, together with the technology it helps to create, is highly marketable and could be traded internationally to the considerable financial benefit of FRI. However, achieving a financial rate of return is not the primary purpose of FRI, nor will it be so when FRI is established as a Crown Research Institute. The main aim is to support the forestry sector and to bring benefit to New Zealand. This will be best achieved by increasing profitability of the sector through greater competitiveness on international markets. Benefit to New Zealand will be realised through increased GDP and increased FOREX earnings.

It is imperative to market research and development expertise within a strategic marketing framework of the forestry sector. In this presentation I wish to discuss some of the present and future strategies by which the marketing of research and development expertise can assist the forestry sector realise its considerable export opportunities.

## Marketing a high technology forest industry

The New Zealand forest industry is based on a fast-grown, plantation-managed forest resource. At a time when world opinion expresses concern about depletion of natural forest, especially tropical rain forest, such a resource represents a particular competitive advantage. However, it is not an advantage that can be fully exploited until the benefits of purpose-grown softwoods are fully understood. The concept of a single tree species that can be manipulated, through genetic selection and silvicultural management, to provide raw materials of sufficient versatility to fit it for an extreme range of end uses is difficult to accept in traditional timber markets. Essentially, it is a problem of being too far ahead of the competition. This in itself is of great advantage because with the long time-frames in forestry our competitors will catch up only if we allow them to do so.

Our strategy must be to transfer much of our existing knowledge and expertise to gain increased acceptance of plantation softwoods by potential users. At the same time it is essential to ensure ongoing development so that our lead-time is maintained. In other words, we must accept that we are a small player on international markets and must turn our competitors into allies to realise our opportunities.

The so-called "Cellulose Valley Project", championed by the Forest Industries Council, is a strategy to establish the Forest Research Institute as the international centre of excellence in plantation forestry. To a large extent we are there already, but have in no way marketed ourselves to this end on behalf of the sector. The "Cellulose Valley Project" would encourage:

- stronger linkages with universities, research institutes, and industry, both domestically and internationally;
- increased interchange of scientific and technical experts;
- clustering of industry-based research and development around FRI;
- rapid spin-off from FRI of specialist,

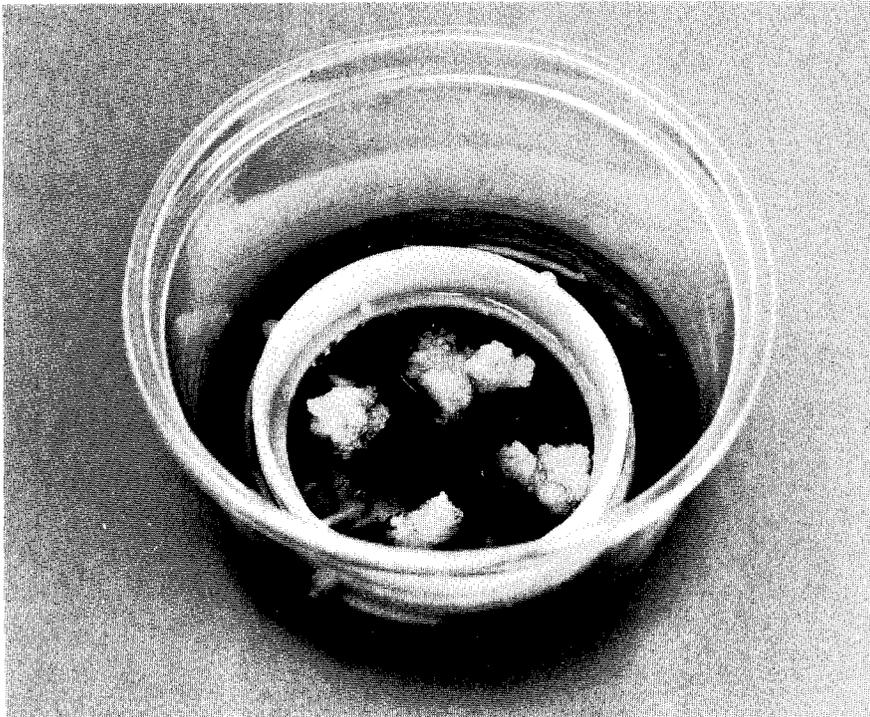
technology-based industries and consultancies.

The benefits that would accrue are:

- more effective transfer of growing technology to establish plantation forestry internationally;
- more effective transfer of processing technology to ensure highest value end use;
- more effective marketing by New Zealand of a long-term, sustainable, and continually improving resource;
- more effective technology transfer to New Zealand industry to ensure constant "lead-time";
- development of a knowledge-and technology-based industry.

This is a grand strategy, but one which will be pivotal to the success of the forest industries. It is also an essential strategy if we are to move away from being a commodity trader in forest products and move towards being a high technology industry trading in value-added products and committed to ongoing technology improvement.

I must note that a high-technology, value-added approach does not automatically exclude trading in logs. Because our forest estate has been the recipient



Embryogenic kauri (*Agathis australis*) tissue growing on liquid medium in a membrane raft. This tissue has potential for use as a genetic engineering delivery system. (See comment by John Butcher on Research and Development.)

\* Director, Wood Technology Division Forest Research Institute, Rotorua

of improved genetic stock and advanced silviculture and management, it represents a value-added commodity.

### Marketing technical expertise to gain international acceptance

The FRI is increasingly involved with industry in the promotion of radiata pine in developing markets overseas. Essentially it is the technical knowledge of radiata pine, its processing, and its utilisation that is being marketed to help overcome the negative attitudes and perceptions of fast-grown softwoods in markets accustomed to slow-grown timber from natural forest. It is a role that the FRI can play because of its reputation for scientific excellence and its independence and integrity. Independent verification of our data may also be required. Market penetration can be readily achieved if our timber and timber products are accepted in international standards, which are now becoming recognised as powerful marketing tools. In addition, verification can be achieved by working with technical experts from the importing country, as was successfully done in Japan in order to gain acceptance of radiata pine as a construction material. Unfortunately, standards acceptance alone is not sufficient to gain widespread acceptance of a new material or product in the market. This can be achieved only by convincing the local processor or manufacturer, and through them the consumer, of its merits.

An appropriate mechanism is to conduct consultancies based on our technical expertise and to transfer our established technology. Marketing technical knowledge in parallel with our raw material or products is absolutely essential if we are to avoid poor processing and inappropriate use of radiata pine, both of which can seriously damage its reputation. Radiata pine differs sufficiently from other commercial softwoods to require some changes to established processing in most off-shore markets. To export radiata pine without our knowledge and "know-how" almost ensures misuse and will limit our timber to low-value end uses. This problem is becoming particularly pertinent as the forestry sector begins to establish high-value logs and semi-processed products in international markets.

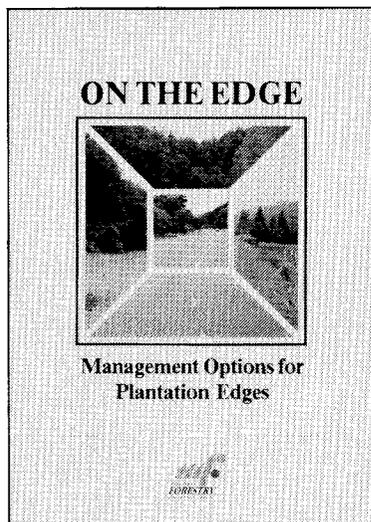
### Marketing expertise and technology with the product

In theory, the greatest returns to the forestry sector and New Zealand will be achieved by linking our technology with our export products. This is already being done with some of our log exports, because forest-growing technology can be regarded as being an in-built component of higher-value logs. However, there is a series of opportunities to link technology (or research and development expertise) with our exports, and each technology add-on should help realise increased prices or increased market share.

Logs of clearwood, which are suitable for high-quality panelling, furniture, and veneers, will attract higher prices if their quality can be guaranteed during transportation and up to the time of processing in the importing country. Applying the newly developed log protection technology creates that opportunity, and additionally provides a marketing edge over our immediate competitors dealing in radiata pine.

Because many of our trade partners in South East Asia lack the appropriate processing technology for handling radiata pine, it is highly likely that the conversion of high-quality products will be difficult to achieve without loss of efficiency. This situation will inevitably create the opportunity in New Zealand for production of high-quality furniture blanks and componentry, for example, thus providing the vehicle for exporting our advanced wood drying technology as a major component of the added value.

Similar opportunities are being pursued with preservative-treated wood products for which our advanced processing technology is creating a competitive edge in target markets, but it is not technology alone that effects the opportunity. A major ingredient in the successful trade of treated transmission poles to Bangladesh was the long-established and detailed database on performance of treated poles and the engineering experience on which the strength criteria for pole selection were based that



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Many other technologies are ready to be added to, and marketed with, radiata pine, including green finger-jointing, vapour boron treatment, and wood hardening, all of which will raise the image and extend the application of radiata pine internationally.

### Marketing expertise and technology directly

This is a concept that has not yet been fully explored by the forestry sector. At present, FRI trades in technology internationally after New Zealand companies have declined world-wide involvement in exploitation and such trading will not compromise benefit to the sector or New Zealand.

This situation is acceptable, but greater benefits may result from the FRI and industry jointly exploiting the technology internationally. The type of benefits that can occur are:

- (i) Licensing specific technologies to processors in countries which import radiata pine that would allow value-added processing. This approach would provide a return to the company for a component of off-shore processing, but most importantly would be a vehicle for upgrading the image of radiata pine from its present position as a low-value commodity product. As a consequence, raw material (log) prices should rise and customers should develop an increasing preference for radiata pine so that they can derive commercial benefit from the technological developments. Continual technology improvements will help to establish a dependence on radiata pine long term. If, on the other hand, other wood materials are substituted, in part or in whole, for radiata pine a return to New Zealand would still eventuate through licensing fees and royalty structures.
- (ii) New Zealand will always be a small player on international markets, since even with the expansion of the radiata pine resource we will control less than 2% of world trade in softwoods. Licensing technology to competitors also dealing in softwoods will provide the mechanism for obtaining a proportion of their profits from the

international marketplace. In addition, we will gain information on off-shore markets and potential market developments. We can also "coat-tail" on market development undertaken by competitors with our technology, or possibly share in market development costs for a new range of products. Marketing New Zealand technology in this manner is a mechanism to achieve some forward integration in off-shore markets. It is also fundamental to the development of the high-technology forest industry envisioned in the "Cellulose Valley Project".

- (iii) A further component is the potential for linking our technology developments with those of our countries. These linkages immediately expand the pool of expertise available and it is likely that we benefit as much from technology imports as technology export. Joint development in off-shore target markets also helps to overcome the wide-

spread "not invented here" syndrome and allow more rapid market penetration.

### Conclusions

Research and development expertise is a valuable resource, but one which needs management to ensure greatest rate of return on investment. The days have gone in New Zealand when research and development was simply input-funded and the nation waited breathlessly for the next serendipitous invention. Now it is output-funded with the aim of achieving more purposeful research, and certainly New Zealand is beginning to see the benefits of such an approach. However, research and development expertise can be employed in other ways to benefit productive sectors in New Zealand, and I have attempted to explore some of the ways in which it can be used to extend the marketing of radiata pine to achieve greater export earnings. Research and development should not be regarded as an activity from which industry can benefit from time to time by taking up developed technology, but rather as an integrated activity of a productive sector from which continued benefit should be sought.

## Forestry development as a target for social assistance

### Mike Blakeney

Unlike the New Zealand Forest Service prior to 1987, the Ministry of Forestry does not administer any services which are directly targeted at social policy. However, its services can and do provide significant indirect benefits to society. The positive social impact of forestry is particularly strong because the sector is rurally based and provides employment.

There is a strong potential for forestry development in a number of parts of the country which coincidentally are regions with particularly high unemployment. For example, land is available and suitable for afforestation in Northland, the East Coast and Southland. Much of the work involved in planting and silvicultural

does not require people with high-level qualifications.

The forestry industry employs a relatively high proportion of Maori. Of the total Maori workforce, approximately one-third are employed in forestry. (See Table 1.)

Investment in afforestation not only provides employment through the establishment phase, but creates the potential for far greater employment later on when the tree crop is tended, harvested and processed. (See Table 2.)

Although job creation schemes may provide short-term relief measures, the

TABLE 1: MAORI EMPLOYMENT IN THE FORESTRY SECTOR AND IN THE TOTAL WORKFORCE

	Total employment	Maori Employment	
		(1)	(2)
Forestry	11,168	3,242	3,759
Total New Zealand	1,388,875	103,833	134,732

1 = by solely Maori origin.

2 = Maori by origin or descent.

Source: Department of Statistics, 1986 census.