Wood production for specific uses — a market-oriented approach

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ABSTRACT
Special purpose wood production has in the past been strongly influenced by the dominance of radiata pine (Pinus radiata D. Don) in New Zealand exotic plantation forests. Woods with technical properties different from those of radiata pine were perceived to be in short supply in future years, resulting in the selection and promotion of quick-growing species capable of producing such woods. This article focuses on incorporating customer needs and wants into a market-oriented approach to wood production for explicitly identified uses. Low buyer price sensitivity is highlighted as a possible screening criterion for identifying and evaluating market opportunities.

INTRODUCTION
The development and implementation of the special purpose concept in New Zealand was logically the first step towards use-based wood production. This article provides a critique of the Exotic Special Purpose Species Policy (ESPSP) published in 1981 by the New Zealand Forest Service (NZFS) and instead proposes a market-oriented approach to the production of wood for specific uses.

The Exotic Special Purpose Species Policy: Rise and Demise
In 1981 the NZFS published a policy document (the ESPSP) setting out its objectives for selecting and growing exotic timber species other than radiata pine. This policy stated: “The objective of establishment of exotic special purpose species will be to meet projected domestic requirements for special purpose timbers currently assessed as approximately 600,000 m$^3$ per annum of sawlogs and to provide at least an equivalent volume as an insurance factor with possible export potential.” (N.Z. Forest Service, 1981)

In addition to domestic “self-sufficiency”, several other aims of the ESPSP were particularly noteworthy. The policy referred to research establishment, although only the eucalypts were mentioned as requiring a minimum resource size (“...at least 100 ha...per annum...to ensure long-term availability”). Sawlogs and veneer logs were to be produced; an estimate of sawlog demand was provided, and risk associated with meeting estimated demand was explicitly recognised. Progress towards achieving the above objective was to be reviewed every five years.

Less clearly defined in the policy were special purpose species (SPS) and timbers themselves. The closest the ESPSP came to defining SPS was: “Special purpose species are those capable of producing timbers suited to such demanding end-uses as furniture and cabinet work, turnery, handles, ladders, exterior joinery, decorative veneer and plywood, poles, crossarms, strip and parquet flooring, and panelling”. Thus SPS were to produce timbers suited for an array of intermediate and end-uses, but also including specific products (e.g., handles, ladders) and processes (e.g., turnery).

However, describing SPS in terms of special purpose timber begged the question — exactly what is “special purpose” about a timber? The ESPSP noted: “Although radiata pine is, and will continue to be, the principal exotic forest species to be planted and managed in New Zealand’s State forests, its timber properties are not well suited to some demanding end-uses where higher standards in decorative features, dimensional stability, and surface hardness are required”. Therefore special purpose timber was defined in terms of the performance deficiencies of radiata pine timber*.

The ESPSP specified a group of species (a) whose timber met the wood property criteria and (b) which could be grown in New Zealand. Eight species were listed, along with prospective uses for their timbers:

- Acacia melanoxylon
- Cupressus macrocarpa
- Eucalyptus botryoides
- E. saligna
- E. regnans
- E. fasciculata
- E. delegans
- Juglans nigra

By limiting the number of eligible SPS, the ESPSP sought: “To ensure that a plethora of species with widely differing timber properties and with little utilisation potential do not eventuate”. Specifying a few rather than many species also served to focus research effort and resources.

The ESPSP made limited provision for examining (for research purposes only) the special purpose potential of additional species. Douglas fir (Pseudotsuga menziesii (Mirb.) Franco.) did not meet the special purpose criteria.

The 600,000 m$^3$ domestic demand estimate was calculated from projections of timber (clear and dressing grade) and decorative veneer consumption, rather than underlying economic factors. Because of lack of knowledge of substitution patterns, domestic demand for special purpose woods was assumed constant for the 40-year horizon of the ESPSP (i.e., 1976-2015).

* Natural durability was not included among these properties, although the ESPSP did recognise a case for producing naturally durable timbers for farm use.
Several factors contributed to the proposal and adoption of the ESPSP. These included:

1. The existence of a policy process to provide Government with advice concerning forestry matters, coupled with a sympathetic Government attitude towards intervention in pursuit of specific policy goals.

2. The existence of a State-owned forestry agency involved in both exotic plantation and indigenous forestry, and forestry extension.

These two factors have since changed dramatically. The Government signalled its non-interventionist stance by abolishing forestry encouragement schemes and disbursing the New Zealand Forestry Council (a policy advisory body). The Ministry of Forestry (MOF) and Forestry Corporation emerged from a radical reorganisation of the NZFS which separated commercial, service, and environmental functions. The Forestry Corporation became an exotic forest owner and wood supplier, the MOF assumed a sector servicing role and lost direct involvement in growing and selling wood, other than for research and consultancy purposes.

The ESPSP initiative of the NZFS was dropped, partly because the MOF no longer had any direct control over any land bank or established forest estate. Subsequently, another policy statement was drafted but not formally endorsed by the MOF. "Guidelines" based on the draft policy have been adopted instead.

Critique of the Exotic Special Purpose Species Policy

In distinguishing general from special purpose uses, the ESPSP implicitly acknowledged differences in wood use. Advocating tree planting for special as opposed to general purpose uses was tantamount to advocating a deliberate (though de facto) strategy of use-based diversification. However, the ESPSP did not examine whether a use-based diversification strategy should be pursued.

In advocating use-based diversification, the ESPSP used, as screening criteria, wood properties complementary to those of radiata pine. This "complementary" approach may be criticised on at least three counts.

1. It reflects performance deficiencies of radiata pine timber rather than use opportunities per se. It is unduly restrictive for woods with properties not complementary to radiata pine but markedly superior or highly valued, and where an established market exists.

2. It relies on subjective judgements concerning which wood properties to use as screening criteria. The ESPSP emphasised sawn timber and veneer uses – other wood properties necessary or desirable in other uses were ignored or overlooked (e.g., energy content for heating, fibre length for certain paper products).

3. It contains untested assumptions about markets for special purpose timbers and the best way to sell these timber products. An analogy may be drawn with the width of the product assortment offered by a firm, i.e., the range of products and product lines (closely related products) which it offers customers. The assumption underlying the ESPSP is that a firm would offer a general purpose timber as its main product (i.e., radiata pine), and that other products (e.g., special purpose timbers) would complement or flank the main product. However this may not be the case, or even desirable – a small firm facing large, dominant firms has an incentive to specialise its operations away from the dominant firms.

The ESPSP argument for domestic self-sufficiency does not assure either present or (expected) future profitability. The most appropriate screening criteria therefore are those that identify specific, profitable market opportunities, including any which complementarity might rule out. Fenton (1978) observed that: "Generally speaking, the more specialist the outlet, the greater the risk unless long-proven markets or other special reasons for the product exist". He did not mention any "special reasons" but the ability of sellers to influence product price is one possibility. Sellers will not be price-takers when buyers have low price sensitivities because, for example, buyers may regard certain woods as essential for some reason (e.g., decorative appearance, traditional practices, cultural attitudes). When buyers are insensitive to price, sellers then can consider investing in and protecting market development efforts from competitors and competing products, perhaps by differentiating their product or cultivating buyer loyalty in other ways. When buyers are price sensitive, however, market development can be undermined by price cutting, shifting emphasis to low cost, highly efficient production of undifferentiated commodity products, indistinguishable between sellers.

Other "special reasons" might include buyer sensitivity to changes in income and the effects of substitute products, demographic characteristics of potential buyers (reflecting market growth potential), and potential market size. Given the lead time required to establish, grow, and harvest a crop of trees, both evolutionary and revolutionary market change must be considered.

It is tempting to use the prospect of limited wood supply or the anticipated number of suppliers as screening criteria for profitable market opportunities. Either may allow the seller to influence price, especially if the seller sells large volumes relative to the total bought and sold in a particular market. Neither criterion, however, distinguishes undifferentiated commodities for which buyer price sensitivity is high from products for which buyer price sensitivity is low.

Wood Production for Specific Uses: A Market-oriented Approach

A market-oriented approach to wood production for specific uses has important advantages over the approach embodied in the ESPSP. First, the approach seeks opportunities based on commercial potential, meaning that use-based diversification stands – or falls – on commercial merit. Second, it assists in bolstering grower (and investor) confidence in growing trees. Third, it recognises the interdependence of growers, processors, manufacturers and distributors (including wholesalers and retailers). Fourth, a market-oriented approach directs species or product research by use prospects.

There are five stages in this market-oriented approach to wood production for specific uses:

1. Identify specific uses and evaluate their market potential.

2. Determine whether it is possible to produce wood in New Zealand which meets the appropriate specifications for these uses.

3. Compare the wood produced in New Zealand with that available from other sources, including traditional, long-established and potential future sources.

4. Establish a comparative advantage exists in producing wood for carefully targeted, commercially promising uses.

5. Determine where and how the grower should grow the wood required for the targeted uses.

In practice, these stages are not necessarily consecutive nor clearly distinguishable from one another.

First, uses for which wood is the preferred material (and reasons why) must be identified. A detailed understanding of buyers' preferences is necessary to ensure the wood produced will satisfy customer demand in the target markets.

Once identified, the commercially promising uses may be targeted as opportunities worth pursuing, using screening criteria such as those discussed above (still other criteria may emerge from detailed market and marketing research). No distinction need be drawn between domestic and export markets since the attractiveness of the opportunities themselves...
will influence where (and how) the wood is consumed. Domestic markets may be completely bypassed with wood produced for export markets only, or used as an outlet for undesired by-products (such as out-of-grade timber), or as a platform from which export markets are developed.

Evaluation of the acceptability of the wood produced is the second stage. During initial development probably only a technical assessment of wood properties is required. Later, as experience in target markets accumulates, other, often subjective considerations are likely to emerge as understanding of consumer preferences matures. It is likely manufacturers and distributors will be best positioned to take advantage of these preferences for marketing purposes.

The third stage is to compare New Zealand-grown wood with that from competing suppliers in the same target markets. This will highlight any intrinsic advantages or disadvantages. In this respect potential competitors may be even more important than current competitors.

The fourth stage, establishing comparative advantage, is the nub of wood production for specific uses. Nationally, comparative advantage determines whether a country is a net exporter or importer of wood. At the firm level, there must be advantages in producing, processing, manufacturing, or marketing wood for the target markets; these then can be built upon, exploited, and protected. There are numerous possibilities, including availability of highly favourable growing conditions, superior growth rate and yield, superior technical knowledge and managerial ability, an established infrastructure supporting wood production, early anticipation of market opportunities, ability to assure supply continuity, and recognition and exploitation of scale economies.

The fifth stage is technical in nature: how should the type of wood required for the target uses be produced? Besides the physical aspects of wood production (e.g., site selection, pruning and thinning treatments), social and political factors are important, influencing, for example, individual and organisation decisions concerning resource establishment. Another part of this fifth stage is co-ordination of production and processing with marketing activities, particularly in the absence of well-established markets.

**SUMMARY**

The ESPSP provided a convenient starting point for use-based diversification. However, relying on species' wood properties and abilities to grow on New Zealand sites has resulted in species and product considerations dominating special purpose wood production at the expense of a use-driven perspective. Producing wood for specific, rather than special purpose, uses requires complementing the previous supply "push" of the ESPSP with a demand "pull" component in searching for profitable market opportunities.

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**FRI/Industry Research Co-operatives - A framework for successful collaboration**

**S.D. CARSON**

**SUMMARY**

FRI/Industry Research Co-operatives, formed in response to user-pay requirements, have been very successful in achieving and implementing research results and in encouraging a team approach among industry organisations and FRI. A Co-operative is formed in order to achieve a set of technical objectives. Organisations join and researchers participate as appropriate to these technical objectives. Co-operative research is directed by a Technical Committee, managed by a Programme Manager, and carried out by researchers and industry personnel working together. A Co-operative Research Advisory Board, a Research Co-operative Manager, and an FRI Divisional Director oversee and co-ordinate Co-operative activities. Some research projects are more appropriate for the co-operative approach than others. Advantages of Co-operative research compared to industry organisations are: shared research costs, research goals that are focused on industry needs, faster and more complete technology transfer, and access to all of FRI’s expertise when required. Industry involvement in the research process also encourages industry definition of research goals and provides opportunity for achievement of non-research goals. Co-operative research provides FRI with revenue for research which tends to be long-term, to require less marketing, and to encourage independent thinking and innovation. Publication of results is encouraged to maintain high scientific standards, while the commercial advantage to industry is maintained through review of publications and delay in the release of results for an appropriate period of time. Success of FRI/Industry Research Co-operative research is absolutely dependent on FRI maintaining its reputation as a centre of excellence in forestry research.

**INTRODUCTION**

Because Government departments now have to earn a proportion of their funding, the Forest Research Institute (FRI) has developed a series of co-operative research programmes (FRI/Industry Research Co-operatives) jointly conceived, funded, and implemented by the FRI and industry organisations interested in forestry research. The structure of these Co-operatives was modelled after the numerous university-based co-operative research ventures in the USA, some of which have successfully carried out applied research for over 35 years. FRI and other Co-operative members believe that this development has enhanced the linkages between FRI and research user groups and has improved the direction and implementation of forestry research programmes. The objective of this article is to emphasise that high-quality, cost-efficient research