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# The forest sector and tertiary education

## Expanding opportunities at Lincoln

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### Abstract

*Institutional and legislative changes in the forest sector have created the need for university graduates who are trained in a wider range of disciplines than forest science, particularly business, engineering and planning, but who are still conversant with the sector. Lincoln University has responded by developing a number of undergraduate and graduate programmes for the forest sector that are substantially different from what is typically found in a forest science programme. Central to undergraduate teaching are the three-year degrees in Bachelor of Commerce (Forestry) and Bachelor of Resource Studies with a forestry option. In both degrees, students can take 25% – 35% of their papers in forestry subjects, with the remainder being in either commerce or resource studies, as appropriate. Students graduating from these programmes are not intended to compete in the technical forester market. Rather, B.Com. (Forestry) graduates will have a commerce degree combined with knowledge and skills specific to the forest sector. Similarly, B.R.S. graduates will have broad resource policy and management training, but with a focus on forestry. At the graduate level, Lincoln University offers a specialised Masters in Applied Science in Agroforestry, and is developing a Masters of Engineering in Forest Harvesting.*

### Introduction

The forest sector in New Zealand has undergone some fundamental changes in recent years. A large part of the change has been due to a combination of institutional shifts and new environmental legislation. The forestry estate in New Zealand by the late 1980s had changed from a long-held pattern of predominantly gov-

ernment and corporate ownership to one with minimal government ownership and an increased proportion of small holders. Nearly 20% of the total plantation estate is now in the hands of over 12,000 owners. Corporate ownership is expected to further decline to 50% by 2005 (Marren 1994). These new owners include farm foresters, small investors and investment syndicates, most of whom would have had little previous experience in the forest sector. One of the implications of these changes is that the forest sector will be requiring a much wider variety of skills than in the past. For instance, there will be a need for delivery of training on industry standards to a diversified ownership and workforce, development of log markets to meet the needs of processors and forest owners, and the expansion of secondary markets for immature forests (Marren 1994).

The introduction of the Resource Management Act (1991) in New Zealand brought about further changes in the forest sector. The Act contains an emphasis on sustainable land use, which has helped promote the expansion of forestry onto degraded land by owners who have not traditionally been involved in forestry. There has also been a delegation of planning responsibilities, including forestry, from central government to regional and district councils. In both cases, individuals or organisations are having to acquire knowledge and skills about forestry, forest products markets and the forest sector to deal with the new activities.

Over the same period as the institutional and regulatory changes were occurring, the industry itself was shifting to a much greater export focus, and rapidly expanding the range of countries to which products were being sent. This shift has entailed a different and greater emphasis on market development and marketing than in the past. The trend to exports will continue in the future as current forecasts are for a doubling of output in the next 10 years (Turland *et al.*, 1993), all of which must be targeted at export markets.

### Education and Forestry

Recent reviews of forestry education in New Zealand have highlighted the institutional and regulatory changes occurring in the forest sector and the challenge this creates for employers (Deloitte Touche

Tohmatsu 1994, Probine *et al.*, 1987). A key outcome of this change is an increase in the number and variety of organisations that are involved in 'forestry'. In fact, the term forestry can now be seen to encompass a much broader range of activities than that of technical forestry. Employers still require technical foresters, but increasingly they require graduates who have degrees in business, planning or engineering, and who are conversant with forestry.

As would be expected in today's economic environment, tertiary education providers have responded to the changing market needs by developing new programmes. In some cases, this entails adding to the range of courses offered in existing degrees, and in others this has brought new degrees. The forestry education reviews point out that established forest science degrees, such as offered at Canterbury University, focus on sciences. This is because the degree must meet the academic requirements for technical foresters within a four-year degree. As a result, forest science degrees have difficulty in accommodating all of the new forest sector demands for graduates with different skills. Recognising that forest science programmes will not fully satisfy the needs of the forestry sector, Lincoln University has developed new degrees that focus on the gaps in forestry-related education. These include the areas of business, planning, engineering and agroforestry. A major objective of all of the teaching programmes is to enhance graduates' abilities in information-gathering, problem-solving, communication, and flexibility in approaching problems, but within a forest sector context. A key point is that Lincoln University is not duplicating the forest science degree offered by Canterbury University, and will not graduate 'foresters'.

To meet the forest sector's need for business graduates at the undergraduate level, Lincoln University has introduced the Bachelor of Commerce (Forestry) degree. This is a standard commerce degree programme which includes courses related to forestry and the forest products business. This programme is important to the forest products sector in both New Zealand and Australia because it is the only one in the region which provides graduates with this type of training. The programme is unique because other under-

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## Resource Monitoring Unit

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### FUTURE DIRECTIONS

Technology development is rapid, and the capability for collecting and analysing spatial information for resource management is increasing. The Resource Monitoring Unit is well placed to research these tools and to investigate their applications to New Zealand forestry.

graduate forestry business programmes found in North America or Scandinavia typically focus only on forest products marketing and include it as part of a wood science degree rather than as a business degree.

The B.Com.(Forestry) degree is one of a number of named, or specialised, commerce degrees that the University offers. Other named commerce degrees include Agriculture, Transport, Horticulture, Tourism, and Hotel and Institutional Management. As with other commerce degrees, the B.Com.(Forestry) degree is a three-year programme in which students take specialised core papers in forestry and forest business alongside selected commerce specialisations such as economics, marketing, accountancy, finance or business management. The core forestry subjects provide coverage of major forestry topics, including planting and stand management, wood science, plantation business management, and forest products markets and marketing.

To meet the demand for graduates in regional planning who have an understanding of the forestry sector, Lincoln University provides for a forestry specialisation within the Bachelor of Resource Studies degree. The general B.R.S. degree is designed to meet the growing demand for graduates with relevant specialist knowledge in resource systems, skills in problem analysis and communication, and who could respond readily to an ever-changing job market. It is primarily a generalist degree which leads to a better understanding of natural systems, an appreciation of different cultural perspectives and impacts, and the adoption of better resource management practices. Students pursuing a B.R.S. with a forestry specialisation take the appropriate core courses for a B.R.S. degree and in addition, take the same core forestry programmes for B.Com. (Forestry).

With the expansion of forestry activity on farms, there is a growing interest among individuals from a range of non-forestry disciplines to learn how to effectively integrate farming and forestry activities. To accommodate this demand, Lincoln University has introduced the Master of Applied Science (Agroforestry) degree. The M.App.Sc. (Agroforestry) is a one-year professional qualification targeted at graduates in applied science, science, commerce or social science who are interested in integrating farming and forestry. The degree covers the principles, practices and application of agroforestry and farm forestry with a focus on integrating the socio-economic needs of people.

Lincoln University is developing a Master of Engineering (Forestry) degree to provide for graduates in natural

resource, forestry, civil, or mechanical engineering who wish to prepare for professional engineering work in the forest industry, or for mature engineers who are wishing to make career changes. The M.E. (Forestry) course has a modular structure, with each module consisting of three weeks of intensive, on-campus course work. The basic course involves six core papers (modules), although students with little background in forestry would be required to sit two additional core papers in forestry. The eight core papers cover a range of topics, including silviculture, wood science, ground vehicle mechanics, forest roading, product and client management, cable systems analysis, and forest transportation analysis.

In addition to the forestry-specific postgraduate degrees, Lincoln University offers Masters and Doctorate degrees which allow the study of a wide range of forestry-related topics. Current research includes biotechnology and genetics, tree physiology, tree nutrition and site productivity, waste disposal in forests, forest ecology, dendrochronology, wild animal management, forest diseases and entomology, forests and landscape values, recreation and park management, modelling and GIS systems, systems development for optimal log recovery, mechanised harvesting, timber engineering, forestry cost surveys and social forestry. Funding for this research comes from a wide range of sources including the Foundation for Research, Science and Technology, New Zealand forest companies, regional councils, the NZ Forest Research Institute, overseas funding agencies and Lincoln University itself. Postgraduate numbers are currently closely balanced between New Zealand national and international students.

To support these programmes, Lincoln University has initiated a number of changes. There are now four academic staff who have full-time appointments in forestry-related teaching and research activities, and another 24 staff who have input into teaching or are involved in some forestry-related research. A Forestry Consultative Group has been established at the University to help coordinate the activities of staff in different disciplines. The University also has a Memorandum of Understanding with the NZ Forest Research Institute Ltd which facilitates a number of joint teaching and research appointments. There are also links with Landcare Research, another Crown Research Institute with interests in natural resource management.

### Summary

Lincoln University is a new, but important provider of forestry education within Aus-

tralia. Graduates of Lincoln University's forestry programmes will be able to fill a number of identified needs within the forestry sector that are currently unfilled by forest science programmes. The structure of the degrees is such that they are complementary to the forest science degree offered by Canterbury University, and provide for a more complete coverage of the tertiary education needs of the forest sector in New Zealand. From the industry's perspective, Lincoln University's efforts can be seen as an addition to the range of disciplines from which it can recruit forestry professionals.

Lincoln University has developed a number of new degree programmes which will provide graduates who have training in a range of areas such as commerce, planning and engineering, and who have combined this with a knowledge of forestry fundamentals. The undergraduate programmes in B.Com. (Forestry) and B.R.S. (Forestry) now have students who have completed their first or second years, and current indications are that at least 25 students will be graduating from each of these degrees by the late 1990s. With a University structure where there is no forestry department or school as such, lecturers involved in the forestry programmes are located in the department of their core discipline, and cooperate to deliver integrated programmes. As a result of the new course offerings, many students from other natural resource-based disciplines will also graduate from Lincoln University with a greater awareness of the importance of the forestry sector to New Zealand.

Lincoln University's postgraduate forestry research programmes are also expanding rapidly as the university takes on new staff with forestry skills and other staff from relevant natural resource disciplines win new research contracts from clients with forestry interests. An increasing interest from overseas students is also helping to boost Lincoln University's postgraduate programmes.

### References

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