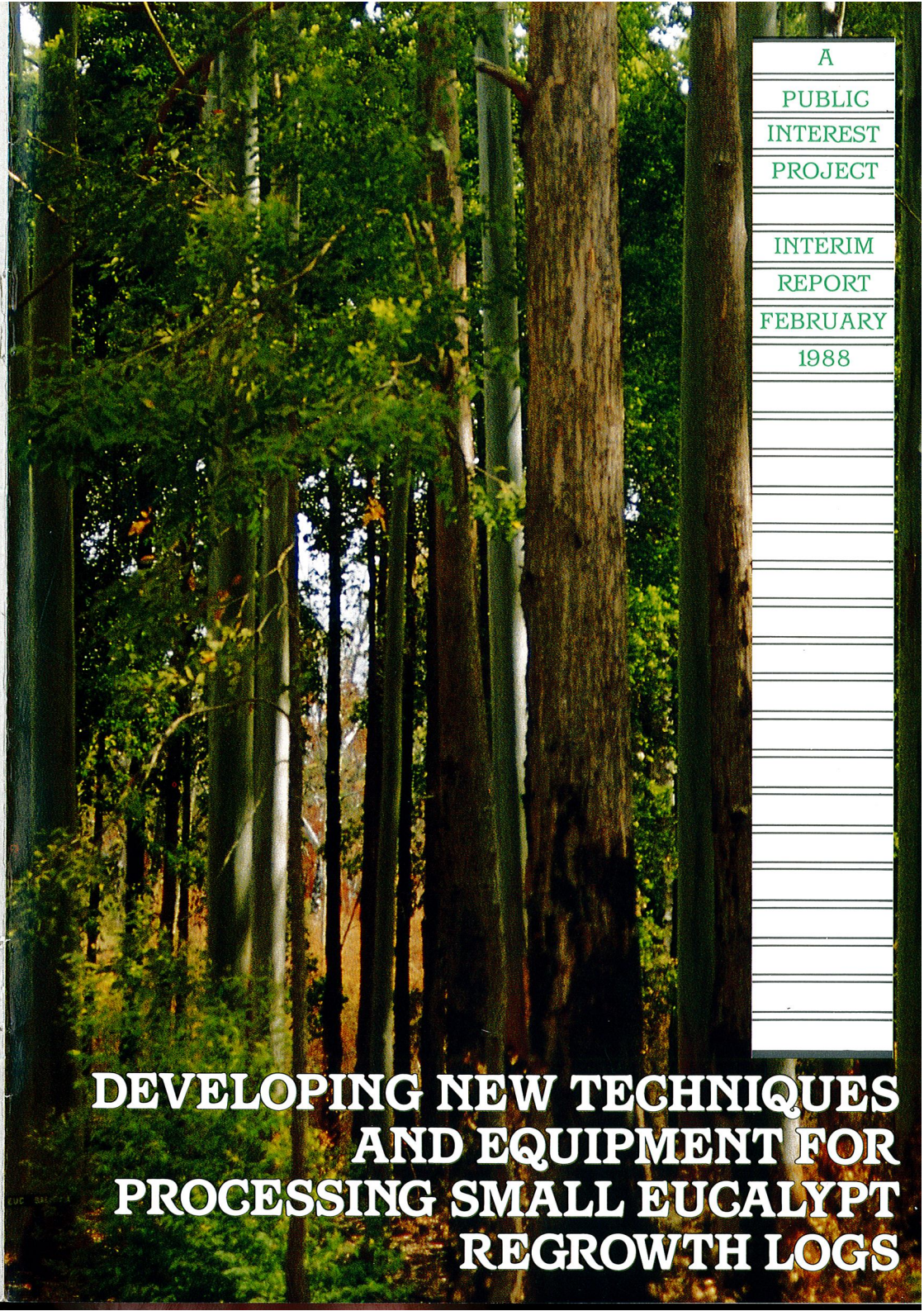


A
PUBLIC
INTEREST
PROJECT

INTERIM
REPORT
FEBRUARY
1988

DEVELOPING NEW TECHNIQUES AND EQUIPMENT FOR PROCESSING SMALL EUCALYPT REGROWTH LOGS

PREFACE

In November 1985, The Forest Production Council of Western Australia submitted a proposal to the Commonwealth Government seeking support for a study to establish techniques and develop equipment to process commercially small eucalypt regrowth logs.

The proposal was approved, and in 1986 the W.A. State Government signed an agreement with the Commonwealth for a Public Interest Project.

The State conducts the project under the agreement, with one third of the funding provided by the Commonwealth, one third by the State, and one third by separate arrangements between the State and organisations involved in the Australian timber industry.

The four-year agreement has an expenditure of $4,631,000.

The Australian Industrial Research and Development Incentives Board monitors the progress of the project.

As the Commonwealth representative, acting through the State office of the Department of Industry, Technology and Commerce, I report on the project's progress and convene quarterly meetings to review the project.

To provide representation for financial contributors, and liaison and cooperation between the State and relevant groups nominated in the agreement, a representative from each of the following attends each meeting:

Chemical and Wood Technology Division of the CSIRO (Melbourne); Curtin University of Technology; Western Australian Committee of the Australian Timber Research Institute.

Advice and discussion are sought from the members of the committee and future direction is considered.

At each meeting, the project manager reports on money expended on the project, liabilities, technical progress, and property acquired or constructed.

I am pleased to release this report on the first year of this Public Interest Project.

Lindsay Marsh

INTRODUCTION

In Western Australia, as in most other States, the supply of available logs from mature eucalypt forests will have been depleted in about 50 years. Some regrowth forests have already been harvested, and all future hardwood must come from these forests.

Regrowth logs differ in many ways from mature logs: They are smaller, of different colour, and require different seasoning and drying treatments. The physical characteristics of regrowth logs demand new processing technology and equipment.

The development of these techniques and equipment will help to ensure our future supply of timber and relieve the pressure on our remaining mature hardwood forests.

THE TIMBER STRATEGY — Heading in the Right Direction

The W.A. Minister for Conservation and Land Management in 1987 released the Timber Strategy, which is a plan for an efficient, sustainable timber industry in W.A. The strategy also provides for the protection and management of water catchments, conservation and recreation values in the State's forests.

The W.A. Timber Strategy aims to upgrade research into timber utilisation and marketing by the Department of Conservation and Land Management (CALM), in co-operation with the forest industry. This will be accomplished by:
integrating forest growers, producers, manufacturers and users to achieve a better understanding of consumer needs;
adapting forest management and silviculture to meet changing markets;
conducting research to enable use of available timber resources as efficiently as possible;
co-ordinating joint research projects between different sections of the forest-based industry.

Many of these aims are being and will be addressed by work carried out at the Wood Utilisation Research Centre (WURC).

THE WOOD UTILISATION RESEARCH CENTRE

In 1983-84, a research complex was created on the site of an old softwood mill at Harvey by the former Forests Department. The mill was restructured in 1983 to handle small regrowth hardwood logs as well as pine logs, and the first sawmill improvements were made and experimental drying kilns constructed.

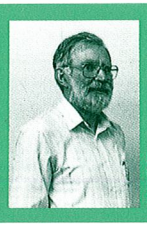
In March 1985, the Forests Department became part of the Department of Conservation and Land Management.

The WURC is used by CALM to develop and examine new techniques for sawmilling, seasoning and marketing timber from W.A.'s regrowth and mature hardwood forests and softwood plantations.

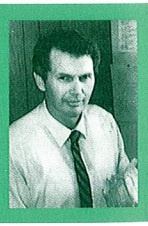
In its application for Public Interest Project funding, the Forest Production Council said: ''The Wood Utilisation Research Centre is well suited for applying the modern industrial research necessary to conduct this work. To respond to consumer demand, a concerted effort by foresters, sawmillers, wood processors, timber merchants and wood producers has the best prospects of success. Nowhere in Australia is the research environment better structured for this integrated forest-based industry approach than in Western Australia.''

SOME OF OUR STAFF

Mr P.N. Hewett, Director of Forests — Chairman.
Mr D.J. Keene, Divisional Manager — Forest Resources.

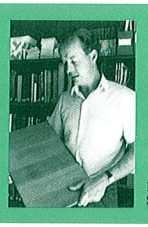


Mr Phil Shedley, Co-ordinator and Public Interest Project Manager.



Dr Graeme Siemon, Principal Research Scientist.

Mr Des Donnelly, Chief Utilisation Officer



Mr Don Challis, Secretary.

Mr John Dorlandt, Accounts.

STAFF

The WURC draws staff and resources from a number of branches of CALM.

The research programs are approved by a Policy Panel comprised of the following:

Mr P.N. Hewett
Director of Forests — Chairman.

Dr P.E.S. Christensen,
B.Sc. (Hons)(Rhodes), Ph.D.
For. Cert. (Kenya). Representing the Divisional Manager, Research.

Mr D.J. Keene,
B.Sc. (For), Dip. For.
Divisional Manager, Forest Resources.

The Chairman of the Forest Production Council's Research Panel. Pending the formal appointment of members of this body, Mr C.C. Kneen, B.E. (Civil), Manager Forest Products Association, represents industry.

The operation and management of the WURC is by a Co-ordinator and Management Committee comprising:

Mr Phil Shedley,
B.Sc. (For), Dip. For., AIWSc.
Co-ordinator and Public Interest Project Manager — Chairman.

Dr Graeme Siemon, B.Sc.
(For)(Hons), Ph.D., AIWSc. Principal Research Scientist.

Mr Des Donnelly
Chief Utilisation Officer.

Mr Don Challis, B.A.
Secretary.

Mr John Dorlandt.
Accounts.

A number of Technical Planning Groups determine the objectives and strategies for specialist fields of research. Each has representatives from the WURC Management Committee, industry and the research team.

Technical Planning Groups and respective industry representatives are:

Sawmilling: (includes stockpiling and log product specification)

Mr Ron Adams,
Grad. M.I.E. (Aust)

Mr Greg Meachem,
Cert. Bld Reg Bd., Cert.
Trade Studies Machinery.

Seasoning:
Mr Hiski Kippo,
B.App.Sc., Dip.Chem.Eng.,
Dip.Chem., M.Sc.

Mr Cam Kneen, B.E. (Civil)

Mr Lester Underdown

Processing:

Mr Dino Gosatti

Mr Richard Schaffner,
B.E. (Hons) M.Eng.Sci.

Computing:

Mr Mike Goddard, B.Comm., M.B.A., A.A.S.A., C.P.A.

Marketing:

Mr Rod McInnes

Mr Hedley Van Der Straaten

Mr Mike Goddard

Wood Properties:
Dr Don Jenkin,
M.Sc.(Chem), Ph.D.
Wood science and technology.

Other CALM staff directly involved with research and administration are:

Mr Gary Brennan, B.Sc. (For).
Seasoning and wood properties.

Dr Elaine Davison, B.Sc., Ph.D.
Mycology/pathology

Ms Diane Gibson, B.Sc., Dip Comp.
Computer programming and modelling.

Mr Brett Glossop, B.Sc. Computer programming and biometrics.

Mr Wayne Hanks. Seasoning.

Mr Lex Mathews. Manager,
WURC Harvey.

Mr Trevor McDonald, B.App.Sc.
(Mech.Eng). Engineering.

Mr Peter Newby, Cabinet-maker.
Consultant in wood machining.

Ms Amelia Oberthur.
Administration

Mr Steven Raper, B.Sc. (For).
Sawmilling and administration.

Mr Francis Tay, B.Sc. (Hons).
Mycology/pathology.

Mr Alan Thomson, B.Sc. (For).
Seasoning and processing.

Mr Kevin White. Sawmilling.

The following Departmental staff also contribute to the utilisation research programs:

Dr Ian Abbott,
B.Sc. (Hons), Ph.D. Entomology.

Mr Jack Bradshaw, B.Sc. (For).
Hardwood silviculture.

Mr Hugh Campbell, B.Sc. (For).
Inventory.

Mr John Clarke, B.Sc. (For). Timber production.

Mr John Kaye, B.Sc. (For). Softwood silviculture.

Dr George Malajczuk, B.Sc. (For)
(Hons), M.Sc., Ph.D.
Computer modelling.

Mr John Malone,
Cert.Mech.Eng.Draft.
Engineering drafting.

Mr Trevor Morgan,
B.Sc. (Hons), M.Sc., Dip. Comp.
Computer services.

Dr Joanna Tippett, B.Sc., Ph.D.
Pathology.

EQUIPMENT

Log storage:— programmed water sprays with a capacity of 5000m log storage. Earth dam and recycling pumps.

Sawmilling:
— overhead beam feed with twin breakdown saws
— band resaw
— horizontal band breaking down saw
— docking saw
— chipper
— enclosed stripping and storage facilities

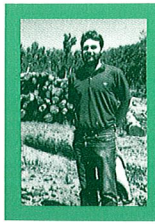
Seasoning:
— two research tunnel kilns
— research batch kiln
— laboratory high temperature kiln (to 1m)
— commercial high temperature kiln (to 20m)
— reconditioning chamber (to 20m)
— computer data logging and control of tunnel and batch kilns
— climate controlled evaluation room
— drying ovens
— electronic balances

Dressing:
— square dressing planer
— buzzer
— thicknesser

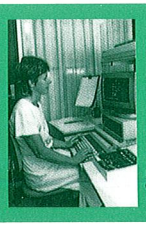
Grading:
— mechanical proof grader
— static tester
— pole test rig

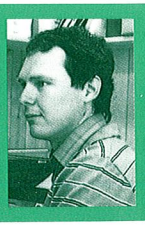
Product Development
— panel saw
— manual gluing frame
— docking saws

Storage:
— adequate covered storage areas.


Mr Gary Brennan, Seasoning and wood properties.


Dr Elaine Davison, Mycology/pathology.


Ms Diane Gibson, Computer programming and modelling.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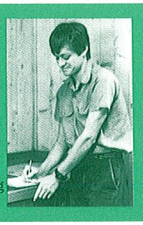
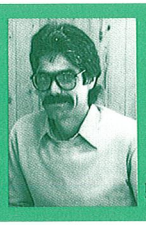

Mr Wayne Hanks, Seasoning.


Mr Lex Mathews, Manager, WURC Harvey.


Mr Trevor McDonald, Engineering.

RESEARCH PROJECTS — Past and Present

Research trials have included the following projects.

Harvesting

A major harvesting trial compared five different machines and methods for felling and snigging in regrowth jarrah stands, and determined a range of commercially viable options. Long length logging was recommended.

A study of forest residues showed that even after six years on the ground the moisture content of jarrah logs remained above fibre saturation point (f.s.p.).

Stockpiling

A trial comparing five different watering regimes on jarrah logs showed that a regime of one hour on, three hours off produced logs with limited end splitting and reduced growth stresses, similar to results with continuous watering. Another trial is assessing lower watering rates to save water and energy.

Sawmilling

Research will include sawing principles and details for green and seasoned products. Sawing principles will include breaking down methods using edger saws, through and through sawing, conventional, and line-bar cutting patterns. Sawing details will take into account differing log dimensions and product requirements using patterns established and published by other researchers.

Seasoning

The seasoning research program concentrates on producing furniture grade timber and other value added products. Previous research showed that eucalypts should be dried in two stages, from green to fibre saturation point (f.s.p.) and from f.s.p. to final moisture content. Current research programs are using the batch kiln to develop efficient schedules to prevent checking in the few days after milling, which is the most critical period in the development of seasoning checks. After finding a reliable schedule for that initial stage, conventional CSIRO schedules will be tested, and modified if required, in drying down to f.s.p. The final stage will be to dry timber from f.s.p. to final moisture content, and to compare timber dried using conventional kiln schedules to similar material which is high temperature dried. Detailed assessment of moisture gradients at each stage will be made.

High temperature seasoning of jarrah boards has been done successfully in both the laboratory high temperature kiln and the commercial kiln.

Several preliminary investigations to test improved methods of monitoring timber moisture contents have begun at other research institutions.

Wood properties

Preliminary strength tests which compared regrowth and mature specimens of jarrah, karri and marri showed that regrowth material has similar strength to mature wood. Further testing is planned. Of particular interest is jarrah, which in the limited sample tested had strength values higher than published data.

The effect of *Fistulina hepatica* (''pencilling'') on the strength of jarrah is the subject of an undergraduate project at the Curtin University of Technology.

A study of brownwood and associated wood destroying fungi in karri is continuing. Fungi isolated from karri samples are being examined and sorted into groups. An inoculation trial in which karri dowels colonised by the test fungi are inserted into holes in regrowth trees is being prepared.

An ongoing survey of the incidence of brownwood is showing a widespread occurrence of brownwood in karri and many exotics planted in the southern forests.

A durability trial with CSIRO Division of Chemical and Wood Technology will compare resistance to fungal attack of selected regrowth and mature W.A. hardwoods, and several Eastern States species grown in W.A. The testing will be done in CSIRO's accelerated field simulator at Highett.

Product Development

A project on sliced veneer production and plywood manufacture from regrowth jarrah and karri has begun. Slicing of figured veneer is also being examined in a search for higher value products.

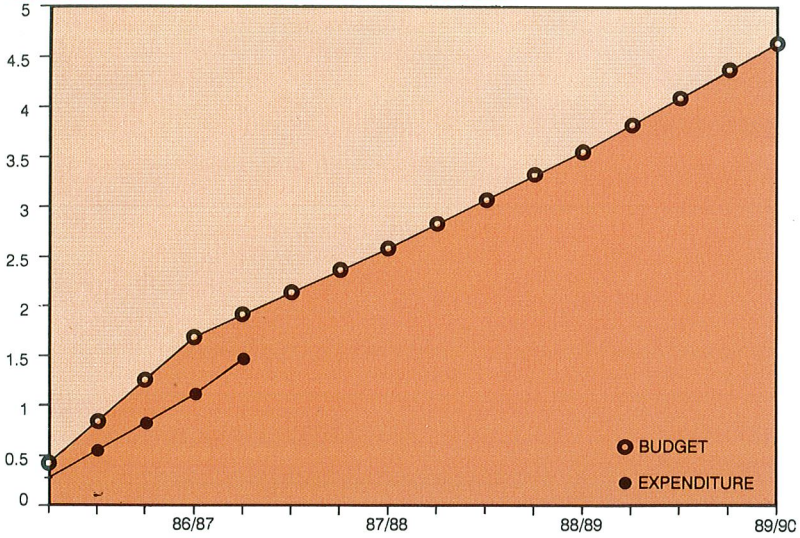
A trial will examine the use of regrowth jarrah for furniture blank manufacturing. The concept of standard edge-jointed panels for use as furniture blanks will increase the efficient use of high value timber.

Management

''GUMTREE'' © (General Utilisation Model of Timber Resource Economic Evaluation) is being developed to model all aspects of a vertically integrated forest-based industry, from standing tree to the marketing of manufactured timber products. The model will be used by policy makers and managers as a management tool in planning the efficient use of forest resources. With the model, alternative wood processing and marketing strategies can be evaluated, and strategies decided. The sawmilling sector module has been completed, and is being tested.

Additional staff will be recruited to develop marketing aspects and to model all the attributes of the log resource.

GRAPH OF BUDGET AND EXPENDITURE

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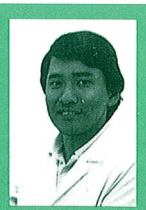
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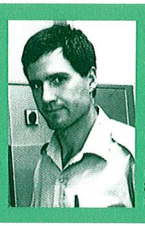
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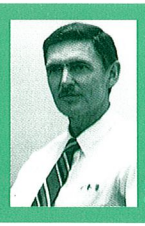
Dr George Malajczuk, Computer Modelling.