

J. W. Gottstein Memorial Trust Fund

The National Educational Trust of the Australian Forest Products Industries



LOG HARVESTING OPERATIONS IN NEW SOUTH WALES AND TASMANIA

TERRY MUMFORD

2000 GOTTSTEIN FELLOWSHIP REPORT

JOSEPH WILLIAM GOTTSTEIN MEMORIAL TRUST FUND

The Joseph William Gottstein Memorial Trust Fund was established in 1971 as a national educational Trust for the benefit of Australia's forest products industries. The purpose of the fund is *"to create opportunities for selected persons to acquire knowledge which will promote the interests of Australian industries which use forest products for the production of sawn timber, plywood, composite wood, pulp and paper and similar derived products."*

Bill Gottstein was an outstanding forest products research scientist working with the Division of Forest Products of the Commonwealth Scientific Industrial Research Organization (CSIRO) when tragically he was killed in 1971 photographing a tree-felling operation in New Guinea. He was held in such high esteem by the industry that he had assisted for many years that substantial financial support to establish an Educational Trust Fund to perpetuate his name was promptly forthcoming.

The Trust's major forms of activity are,

1. Fellowships and Awards - each year applications are invited from eligible candidates to submit a study programme in an area considered of benefit to the Australian forestry and forest industries. Study tours undertaken by Fellows have usually been to overseas countries but several have been within Australia. Fellows are obliged to submit reports on completion of their programme. These are then distributed to industry if appropriate. Skill Advancement Awards recognise the potential of persons working in the industry to improve their work skills and so advance their career prospects. It takes the form of a monetary grant.
2. Seminars - the information gained by Fellows is often best disseminated by seminars as well as through the written reports.
3. Wood Science Courses - at approximately two yearly intervals the Trust organises a week-long intensive course in wood science for executives and consultants in the Australian forest industries.
4. Study Tours - industry group study tours are arranged periodically and have been well supported.

Further information may be obtained by writing to,

The Secretary,
J.W. Gottstein Memorial Trust Fund,
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Terry Mumford is a supervisor with Syndicated Central Gippsland Logging, where he is responsible for the supervision of forest harvesting in the Noojee area of Victoria. He oversees seven contractors operating ten crews within a radius of 80 km from the company office. After completion of secondary school in 1973, Terry worked with the logging firm I. J. Crawford & Co in Morwell, Victoria. Forestry operations were carried out in pine plantations, clear-felling and thinning regimes according to forestry specifications, and in road construction. With over 20 years experience in forestry, management, planning and implementation, the Gottstein Fellowship allowed Terry to evaluate work practices in NSW and Tasmania. He sits on the Board of Management for Syndicated Logging and the Amcor OH&S Management Committee, and is the Liaison Officer for the Department of Sustainability and Environment, and the logging contractors.

EXECUTIVE SUMMARY

Native forest harvesting operations in Coffs Harbour, NSW, and Geeveston, Tasmania, were investigated, with the objective of comparing practices at those sites with those carried out in Central Gippsland, Victoria. The harvesting machinery was generally similar to that used in Victoria, with the exception of the Unicon processing head attachment for an excavator that was operating in NSW. This system provides an effective method for stripping bark from the trees, allowing the waste product to remain in the forest rather than on the log landings. Roading construction in NSW and Tasmania were different from that practised in Victoria, through the use of culverts and cording and matting. Although rainfall in Victoria is lower than that in NSW and Tasmania, the logging season is shorter. It is recommended that steps be taken to improve roading construction methods in Victoria, so that the logging season might be extended.

INTRODUCTION AND OBJECTIVES

Logging operations in Central Gippsland, Victoria are supervised by Syndicated Central Gippsland Logging (SCGL), a non-profit organisation with a staffing level of four, and are carried out by contractors. SCGL liaises with the Department of Sustainability and Environment, planning and operations personnel, and sawmill owners to ensure that all appropriate standards are met, in particular the Victorian Code of Forestry Practices. All in-coupe roading requirements for harvesting operations are the responsibility of SCGL.

Currently, forestry operations in the Gippsland region are seasonal for the period October to May each year. The present project was initiated to increase knowledge in forestry industry practice with particular emphasis on mechanisation and techniques that permit the optimum length of harvesting season. To that end, harvesting operations in NSW and Tasmania were viewed with the following objectives:

- To assess the suitability of new technology in machinery manufactured in NSW for the forest harvesting operations in the Gippsland Region.
- To consider the impact of wet weather practices in Tasmanian harvesting operations on the environment and to assess the use of best practice procedures for the Mt Baw Baw region of Gippsland during wet weather according to the Forestry Code of Practice.

TIMBER HARVESTING OPERATIONS IN STATE FORESTS OF N.S.W. AND TASMANIA

State Forests of NSW are responsible for the planning and management of all harvesting operations on State Forests lands, including the preparation of plans of operations where required. There are 10 full-time logging contractors in the Coffs Harbour district, and one casual contractor is available when required. The contractors provide logs for 30 saw mills.

Forestry Tasmania has a similar role in planning and management of harvesting operations.

Plans take into consideration the following factors:

- location of operations
- operation type
- topography rating
- timing of operations
- expected yield
- integration requirements.

Contractors are involved in planning for the implementation of the harvesting procedures. The operational harvesting plans used are the same as the Victorian plan as they are based on the Forestry Code of Practice and developed into State forestry practices.

Overall Strategic Planning for the development and ongoing maintenance of road and fire trail networks is often complementary to the planning and harvesting procedures for native forests, hardwood and softwood plantations, and plantation establishment.

Machinery

All the machinery in use by the contractors in each State was similar to machinery used in Victoria for the same conditions (Table 1).

Table 1

Comparison of machinery for forestry harvesting operations of 18,000-25,000 m³

NSW	TASMANIA	VICTORIA
Caterpillar 320 excavator with log grab supersaw, Caterpillar 525 grapple skidder, Caterpillar D6C bulldozer.	Landing: Komastu 220 excavator. Bush -Komastu 320 excavator, John Deere grapple skidder.	Caterpillar 320 excavator with log grab supersaw. Clark grapple skidder. Caterpillar D7H bulldozer with grapple and winch.
Manual hand fall.	Manual hand fall.	Manual hand fall.

The exception was the excavator with the Unicon processing head attachment that has been designed specifically for the industry by Mr Denis Smith, from Burgundy Heights Pty Ltd, Bonville, NSW. This particular machine was only used in thinning operations of plantation wood so a comparison on productivity could not be made with operations in Victoria or Tasmania as both States practise clear felling.

The Unicon Head attachment is capable of being fitted to any excavator or purpose-built tracked machinery due to its universal coupling. It is currently undergoing further development and marketing through TimberJack Machinery. The cost of the Unicon attachment is comparable to other national brand mechanical harvesting heads manufactured for specific machinery.

The most outstanding feature of the Unicon head compared to manufactured harvesting heads is the use of debarking feed rollers in the head attachment. The Unicon falling and processing head has a unique barking feed roller system built into the grab arms. This is unusual for a lightweight machine, and it allows smaller machines to have the same

capability as the larger versions. The designer of the Unicon head attachment, Mr Denis Smith, is pictured by the device in Figure 1.

Three contractors in NSW are using mechanical harvesters while the remaining contractors use manual fallers.

Figure 1 Designer of the Unicon Head Attachment, Denis Smith



Forestry Code of Practice for Roads

Road drainage structures must be located, constructed and maintained in such a way that they will have sufficient capacity to convey the peak flow from a 1:5 year storm event. Attention must be given to avoiding disturbance to the passage of native and other fish species during the construction and installation of crossings. In Victoria and NSW this is achieved by the use of culverts and roll-through drains placed strategically to divert water

flow across the roads. These procedures are subject to the Forest Practice Code 4 of the State Forests of NSW, and the Victorian Code of Forest Practices, Timber Production.

Another method adopted by State Forests of NSW is the use of rubber belting bolted to wood and held into the road by steel spikes, positioned on a slight angle across the road. This enables trucks to pass over the barrier without causing stress to the trailer structure that occurs when using the roll-through drain method for water disbursement. The use of rubber belting is a worthwhile practice that could easily be adopted by Victorian contractors as it is a more cost effective, easily transportable, and re-useable method of water disbursement than those currently practised. NSW uses this method of drainage on in-coupe roads only. The following photograph (Figure 2) shows the water disbursement method using the rubber belting adopted by State Forests of NSW.

Figure 2 Water disbursement with rubber belting



Matting & Cording in Tasmania

Tasmanian timber harvesting contractors use the practice of matting and cording of landings and snig tracks for wet weather management and preservation of the natural environment. The practice of matting and cording involves preparation of the initial landing by layering residual wood product on the soil surface, and then covering the wood with a layer of bark from harvested trees. This process allows the water to drain through the bark and is then filtered through the residual wood layer allowing the surface to remain dry and workable. Snig tracks are also layered with smaller scrub and waste products from harvested trees which are placed horizontally on the tracks (Figure 3).

This procedure of wet weather coupe management, although time consuming initially, provides an overall benefit when the practice allows harvesting to continue for 12 months of the year.



Figure 3 Matting and cording in Tasmania

Comparison of the climatic conditions and rainfall in each State

NSW Climate: Coffs Harbour

Summer Temperatures:	Average Maximum	27°C
	Average Minimum	19°C

Winter Temperatures:	Average Maximum	19°C
	Average Minimum	8°C

The average number of raindays for the winter period of 3 months is **26.0**

The average annual rainfall for the Coffs Harbour area is **1703 mm**.

January to March is the wettest period while July to September is the driest period. Heavy rainfall events are common during summer and autumn. In 2000, Coffs Harbour received 28 mm above average rainfall for the year.

Figure 4 Plantation wood in Urunga, NSW



Harvesting Season Victoria

Victorian harvesting season is over a period of 9 months in actual production which produces 75% of the annual volume in the six months November to April; in October, May and June 20% is produced and in the three months July to August, 5% is produced. Provision for pulp/residual log is made via log dumps for the months of July, August and September.

The production level in the Central Gippsland Forest Management Area is between 203,000 m³ and 420,000 m³ of residual log. In regrowth areas, harvesting is mainly carried out by clear felling.

Alpine ash coupes with a high volume per hectare (600-900m³/ha) are predominantly located in the Thomson Valley Water Catchment Area. Melbourne Water restricts harvesting access between 1st December to the 30th April each year. In dry seasons, approval may be extended by one to two weeks by written request.

Other water catchment authorities for the Tarrago and Tyers areas limit access from the 1st November to the 30th May, which in turn limits high production in Central Gippsland to these 7 months of the year.

Harvesting Season Tasmania:

The Tasmania harvesting season is 12 months per year with the maximum production during the months of least rainfall. Geeveston in Tasmania produces an annual volume of 500,000 m³ of clear felling operations in regrowth areas.

Table 3 Most Common Wood Species in State Forests NSW, Victoria and Tasmania

NSW Species	%	Victorian Species	%	Tasmanian Species	%
Ironbark		Alpine ash	16	Ash	15
Tallowwood		Mountain ash	79		
Blue gum		Shining gum	05		
Spotted gum	20	Messmate	45	Messmate	60
New England blackbutt		Mountain grey gum	15		
Blackbutt	70	Silvertop	33		
Diehard stringybark		Yellow stringybark	01		
Turpentine		Red stringybark			
White mahogany	5	Blue gum		Blue gum	10
Flooded gum		Peppermint		Peppermint	05
		Mountain gum			
		Manna gum	04		
Other mixed species	5	Other mixed species		Other mixed species	10

The most common forest species, all eucalypt trees, are listed in Table 3. It may be seen that there is more diversity of species in the mainland States than in Tasmania, and, as expected, a closer match between the Victorian and Tasmanian forests than those of NSW.

The maximum allowable size of forest coupes for harvesting is given in Table 4.

Table 4 Maximum Harvesting Coupe Size in each State

NSW	VICTORIA	TASMANIA
110 hectares	30 hectares	100 hectares

Figure 5 Logging in the Geeveston Area, Tasmania



Wet weather logging

Current Victorian practices require in-coupe roading that requires expenditure on heavy machinery to accomplish drainage culverts, the use of metal screening, grader hire to complete roading requirements and further metal screenings for stability.

Practices in NSW (rubber on boards) and Tasmania (matting and cording) although different, could easily be adopted in Victoria, which would have the effect of being more environmentally friendly, reducing maintenance costs of equipment and roads and providing a more practical and timely method of operation. These considerations would give an overall benefit to productivity. Either method could be adopted in suitable harvesting coupes.

Attention to best practices and time management is required for Victorian operations due to the shorter logging season allowed by the Department of Sustainability and Environment, even though the rainfall in logging operations in Victoria is lower than that at those in NSW and Tasmania.

The average number of days of rainfall over a 3-month period was similar for Tasmania and Victoria, but higher for NSW. This indicates that it would be possible to conduct a 12-month logging season in Victoria.

It should be noted that the Noojee area of harvesting operations is located close to the snowfields of Mt. Baw Baw and thus the area receives a lot of tourist traffic.

CONCLUSIONS

A comparison of the productivity of using a new harvesting machine head was not possible due to plantation thinning rather than clear felling operations that are practised in Victoria and Tasmania.

The inclusion of the rollers between the arms of the head attachment is an innovative and effective method of stripping the bark from the trees. This is an efficient time management practice, which allows waste product to remain, distributed in the harvesting area rather than accumulating on the log landings.

Forest harvesting operations in NSW and Tasmania were similar, being based on the Forestry Code of Practice with minor adjustments to accommodate environmental differences in each state.

The different size of the harvesting coupes for NSW and Tasmania compared to Victoria's allocations of a maximum 40 hectares block size is related to planning procedures that require each coupe to be completed within a 2-year period whereas NSW coupe planning is for a period of up to 5 years.

The landings remain clear of waste allowing safer work practices for workers measuring and cutting log product, snig operations and the overall management practices.

Adoption of the roading practices used in NSW and Tasmania could allow the extension of the season for logging operations in Victoria.