



Farm Forestry: Harvesting and Marketing

**Guidelines for Pine Plantations in the
Adelaide Hills and Fleurieu Peninsula**



FORESTRY SA



WHERE TO FIND IT

How will this help?	3
What should I know about harvesting?	3
Felling	3
Delimiting	3
Docking	3
Extraction	4
Sorting and loading the log products	4
Transportation to the purchaser	4
Harvesting and marketing—what steps do I take?	5
Step 1: When is my plantation ready to harvest?	5
Step 2: How do I estimate the yield and value?	6
Step 3: How do I market logs?	6
Step 4: Which trees do I harvest?	7
Step 5: What do I need to include in a harvesting plan?	7
Step 6: How can I harvest the wood?	7
Step 7: How do I measure the logs and get paid?	8
Step 8: What needs to be done after harvesting?	9
How can I maximise the returns from my plantation?	9
Where can I get help?	9
Forestry SA	9
Regional Development Boards	9
Australian Forest Growers (AFG)	10
Logging Investigations and Training Association Inc. (LITA)	10
Forestry consultants	10
Acknowledgments	10
Appendices	11
Pre-commercial and non-commercial thinning	11
Estimating tree products and the value of your woodlot	11
Forestry SA Royalty Table	12
Roundwood purchasers in the Adelaide region	13
Product specifications	14
Elements of a forest harvesting plan	15
Principal logging contractors in the Mount Lofty Ranges	16
Log measurement procedure	16
Roundwood measurement tables	18
Taxation considerations	19

©David Hanna, Hannco 1998
Published by Forestry SA, January 1998

Design: PIRSA Graphics
Peypress: The Bureau (SA) Pty Ltd
Print: Concord Printing Pty Ltd

Printed on Spicers Monza Satin Ivory, recycled.



HOW WILL THIS HELP ?

These guidelines will help pine woodlot (plantation) owners understand what harvesting involves, decide when and how to harvest and market the wood, and help to maximise long-term profitability.

It is important to appreciate at the outset, that although much of the Mount Lofty Ranges is well suited to commercial timber growing and that there is an existing industry, small-diameter logs from young plantations can be difficult to sell.

WHAT SHOULD I KNOW ABOUT HARVESTING?

This section briefly describes the different processes involved in harvesting which involves felling of the trees, removing the branches (de-limbing), cross-cutting into products (docking), shifting the products to the edge of the woodlot (extraction) and transporting them to the purchaser (transportation).

It is best to use a harvesting contractor unless you have the skill and equipment to take on some or all of the processes. (*See the section How can I harvest the wood?*)

FELLING

Felling can be done manually using a chainsaw or mechanical harvesters.



Figure 1: Manual felling.

DELIMBING

Delimiting involves removing branches flush with the stem and is done where the tree is felled (at the stump). The slash (branches, needles and unsaleable wood) is left to rot and recycle nutrients.

DOCKING

Docking is cross-cutting the tree into log lengths. It can be done either at the stump or at the plantation edge; it depends on the equipment being used. Skilful docking will optimise the range, quality and value of your products. As for felling, docking can be done manually using a chainsaw or with a mechanical harvester.

Mechanical harvesters are generally faster and more efficient in larger plantations. Manual chainsaw felling may be more appropriate for large diameter trees or at sites which are small, isolated or difficult. Harvesters can be fitted to agricultural tractors for smaller woodlot operations.

Productivity rates for chainsaws and harvesters are summarised in *Table 1*.

Table 1: Average falling, delimiting and docking productivity (cubic metres per day)

Operation	Chainsaw (m ³ /day)	Harvester (m ³ /day)
First thinning	10	100
Second thinning	25	200
Third thinning	35	250
Clearfelling	50	350

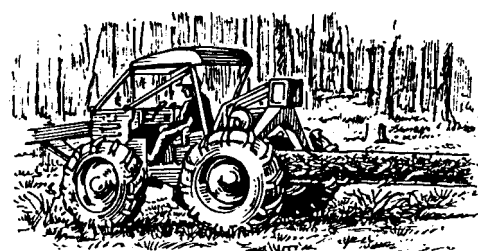


Figure 2: Mechanical harvesting.

Anyone involved in harvesting must have comprehensive training and be skilled in operating equipment to ensure both safe working practices and optimum harvesting production.



The publication *Work Technique in Pine Thinning* (National Timber Industry Training Committee) is an excellent reference manual for fallers. The Logging Investigation and Training Association in Mount Gambier conducts training for chainsaw and logging machine operation (see *Where can I get help?*).

EXTRACTION

Extraction involves removing the logs to a landing or log dump and can be done by either skidding or forwarding.

Skidding

The logs (roundwood) are dragged (skidded) in multiple log lengths by one of the following:

- *rubber tyred skidders* — purpose built, articulated 4WD vehicles with a winch and/or a grapple to secure and lift the butt ends of the logs off the ground
- *crawler tractors* — fitted with the same equipment as a skidder; they can work on more difficult terrain and form their own tracks, but are slower and disturb the soil more than skidders
- *agricultural 4WD tractors* — fitted with safety features and a log grapple or winch; a potentially economical option for small-scaled harvesting.

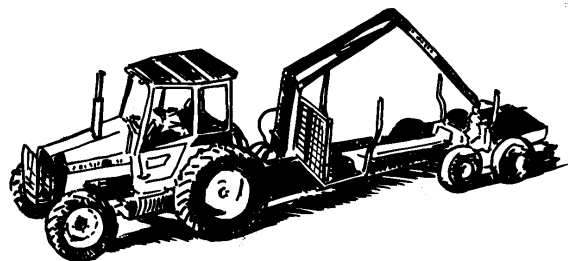
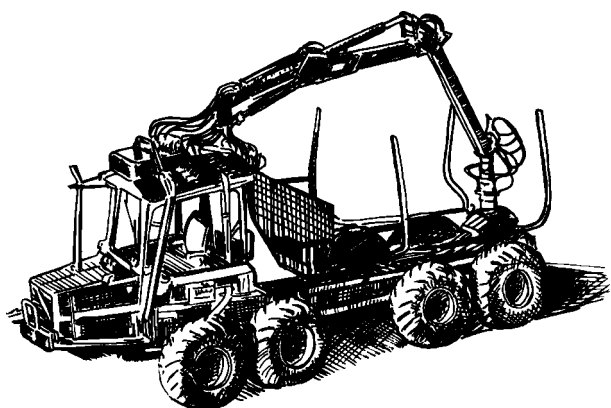


Figure 3: Large scale versus agricultural extraction systems.

Skidding is normally suited to large trees or steep and difficult terrain, but can cause unacceptable soil disturbance in some conditions.

Forwarding

Forwarders are rubber-tyred articulated vehicles with a crane and log grapple which are used to self-load docked logs at the stump. Forwarders disturb the soil less than skidders when taking the wood to the log dump. For small-scale operations an agricultural tractor with a crane and trailer could be suitable.

Extraction distances need to be less than 200 metres to be cost-effective.

SORTING AND LOADING THE LOG PRODUCTS

Sorting wood products into stacks of the same grade and length and subsequent loading onto trucks is done at the landing. Excavator-based grapples or front end loaders are used in larger operations while for smaller operations forwarders are suitable.

Loads must be stacked evenly and secured (*ask the Department of Industrial Affairs*).



Figure 4: Loading logs onto a truck.

TRANSPORTATION TO THE PURCHASER

Trucks, trucks and trailers or semi-trailers are generally used to transport wood products to the mill. The choice depends on the contractor, distance to the mill and access to the site.

The gradient of access roads must be less than 1:10 and a minimum width of 3-7 metres for semi-trailers, increasing by 1-5 metres on bends.



HARVESTING AND MARKETING – WHAT STEPS DO I TAKE?

This section describes the key steps of harvesting and marketing: when to harvest, estimating the yield and value, selling (marketing) the wood, selecting trees to fell, preparing a harvesting plan, harvesting (DIY or engaging and supervising contractors), measuring logs and getting paid, and post harvest operations.

How much you participate in the harvesting and marketing process will depend on your experience, available time and interest. Availability of expertise may also affect how much you do and how much you leave to a forest consultant, or the harvesting contractor, at various stages.

STEP 1: WHEN IS MY PLANTATION READY TO HARVEST?

Normally a percentage of the standing trees are removed or thinned periodically over the life of the plantation. This allows the better quality trees, to produce larger and more valuable logs more quickly. Clearfelling leaves no trees standing. The frequency and type of harvesting depends on two key factors, the rate of tree growth and the demand for products. Faster growing woodlots should be harvested sooner than normal (see Table 2 below) and vice versa. Note that wide-spaced agroforests reach clear felling age much sooner than plantations due to more open planting spacing and earlier and heavier thinning.

A woodlot may be due for first thinning, but the generally limited demand for small-diameter roundwood from first thinnings (apart from fence posts) may make it very difficult to find markets. If this is the case, you should consider removing the poorer non-saleable trees (non-commercial thinning) so that you will still produce valuable and easily marketable large-diameter sawlogs. Not thinning dramatically reduces the long term profitability of a woodlot. One step better than non-commercially thinning (at the time the first commercially thinning would normally be due) is to pre-commercially thin. This involves thinning the trees a number of years earlier and is less expensive (see Appendix 1: Pre-commercial and non-commercial thinning), but will produce a similar outcome.

In summary, if you are assured of a market then thin commercially (for a small income), but if not make the decision early and pre-commercially thin (for a relatively small cost), or failing that, non-commercially thin when normally due for commercial thinning but at a greater cost. Note that thinning too late may increase the risk of wind damage (trees falling over after thinning).

When the trees have increased their diameter to about 45 cm, they are ready to be clearfelled unless there is an opportunity to produce large diameter, knot-free ply quality logs for a premium return.

You should seek advice from an experienced forester to determine appropriate harvesting schedules for your plantation (see the section Where can I get help?).

Table 2: A general thinning guide for Pinus radiata plantations on average sites in the Mount Lofty Ranges

Operation	Age (yrs)	Residual Stocking (trees per hectare)	Products
Initial stocking	0	1600	
First thinning	15	650	small-diameter sawlog and preservation
Second thinning	22	450	small-diameter sawlog
Third thinning	29	250	medium-diameter sawlog and plywood (with appropriate management)
Clearfall	35	0	larger-diameter sawlog and plywood (with appropriate management)



STEP 2: HOW DO I ESTIMATE THE YIELD AND VALUE?

You will need to estimate how much wood you have to in each of the product categories listed in *Table 3* to be able to successfully negotiate sales with purchasers, coordinate harvesting operations and forecast financial returns.

Estimating the yield involves:

- mapping your forest areas into areas that have comparable growth rates and spacing (tree density)
- siting 'assessment plots' so that they adequately represent each 'forest type'
- mark trees to be thinned and calculate their products and respective volumes
- multiplying the volumes per hectare of each of the products in the plots by the area of each 'forest type'

Estimating the value involves multiplying the yield by the value of the products. For more details see *Appendix 2: Estimating tree products and the value of your woodlot*.

STEP 3: HOW DO I MARKET LOGS?

Now that you know when your plantation will need to be harvested and have estimated the yield and the value, it is time to arrange the sale of your wood products. You need to know what products the purchaser wants, how much they are prepared to pay and when they can accept your wood. There are three ways to sell your wood—by the block, for a royalty or delivered to the *mill door*.

Block sale—the plantation is sold for a lump sum to a purchaser who may harvest the wood over a period of time. You will need to accurately assess wood volume and quality to ensure that a fair price is offered.

Stumpage (or Royalty) sale—the standing wood is sold at a price per cubic metre or per tonne. The purchaser is responsible for all harvesting and transport costs. You should ensure that all saleable (merchantable) wood is removed, to maximise return. The wood will need to be measured or weighed independently. *Appendix 3* lists royalty rates for roundwood although purchasers traditionally discount privately grown wood, arguing that plantation management and hence log quality is inferior.

Mill door price—the wood is sold at a price per cubic metre or per tonne delivered to the mill yard. You pay for the costs of harvesting and transport.

These three alternatives promise progressively better returns, but require correspondingly greater inputs. To get the best deal, obtain several prices, remembering that the distance of purchasers from the plantation will affect transport costs and therefore the net return.

Appendix 4 lists wood purchasers in the Adelaide region.

If you have a larger plantation you could consider seeking tenders. Inspection of the trees should be compulsory. Make sure you read and understood the contract. Do not select a tender on price alone and also assess the tenderer's ability to complete the contract successfully and promptly pay you for the wood taken!

Table 3: Roundwood products

Product	Specifications	Uses
Sawlog	small diameter — 15 to 30 cm diameter and about 2.5 metres long	pallets and bins or treated with preservative for use in pergolas etc
	larger diameter — over 30 cm diameter and around 5 metres long	structural, general building and furniture
Plylog	high quality log over 30 cm diameter with (clearwood) knot free sections	plywood and veneer products
Preservation	small diameter — 7.5 to 15 cm diameter	treated with preservative for posts, strainers and rails
Chip or pulp	poorer quality log	paper and associated products



Negotiation

Traditionally, forest owners in the Mount Lofty Ranges have negotiated sales directly with purchasers. Returns have often been poor due to limited competition in the market place and the variable quality of wood products.

Consider a collective marketing approach, with forest growers coordinating wood production and negotiating sales with a single voice. Providing the security of ongoing supplies of wood produced at a standard agreed with purchasers (see *Appendix 5 for Product Specifications*) will strengthen your position. At the very least, join the Forest Grower Network and find out about the experiences of other growers (see *Where can I get help?*).

Discussing your options and prices offered with a professional consulting forester could prove to be well worth the expense.

STEP 4: WHICH TREES DO I HARVEST?

Tree marking involves the selection of trees to be removed by thinning to improve the quality of the remaining trees and provide sufficient space for their continued growth. You can select the trees to be thinned yourself, but need to understand the requirements of the harvesting contractor otherwise felling and extraction may be impracticable. A good way to learn is to engage a professional tree marker and learn by watching and talking—well worth the moderate cost involved.

Proficient tree markers will:

- mark defective, malformed, sick and suppressed trees with paint
- ensure that the volume removed is sufficient to make the operation worthwhile
- ensure that the correct number and quality of trees are retained for optimum future tree development and financial return (see *Table 2 for a guide*); over-thinning (too heavily) will reduce your income from future sawlogs and may also lead to wind damage; under-thinning (too lightly) will reduce current cash returns from log sales and reduce future returns by limiting growth on the best trees
- regularly check their work by counting retained trees in plots or rows to ensure that they are marking the right number of trees

- influence the products produced from the harvesting operation
- mark the trees appropriately for the falling method to be used—often on the south-eastern side for manual falling since trees normally lean to the south-east and a faller will operate in this direction
- provide adequate access for machinery (typically every fifth row of trees) ensuring that the marking is always clearly visible to the operator; in steep terrain, access tracks will be 12.5 metres apart and marked to minimise side slope; in the row adjacent to the extraction row no more than three consecutive trees should remain

STEP 5: WHAT DO I NEED TO INCLUDE IN A HARVESTING PLAN ?

Your harvesting plan is a valuable reference document for the entire harvesting project and provides written instructions for the harvesting contractor and supervisor. Items covered should include:

- a forest inventory (areas, quality and product volumes?)
- a site checklist
- statutory regulations and codes of practice
- identification of appropriate equipment
- harvesting and marketing contracts - obtain professional advice when drawing up legal documents.

A detailed description of a Harvesting Plan is provided given in *Appendix 6*.

Note: Owner/operators must abide by all relevant legislation and ensure that operators are trained and use only approved equipment. As the grower it is also your responsibility to ensure that contractors comply with the relevant regulations.

STEP 6: HOW CAN I HARVEST THE WOOD?

Can I harvest the wood myself?

Advantages:

- using smaller agricultural machinery may be cheaper than engaging a contractor and increase your returns, especially for small or isolated sites



- you could develop your own harvesting machinery and systems to suit small areas, especially if you work with a forest grower group; for example, on-site debarking of posts improves saleability and value (air drying of the material at the plantation edge would reduce transport costs)
- your input can reduce overall costs
- you have direct control over wood quality and utilisation and care of the site
- you have more flexibility with regard to timing of harvesting

Disadvantages:

- smaller machinery is restricted to smaller sized timber
- you are likely to need to purchase machinery or modify existing equipment
- you must ensure specialised equipment complies with standard Logging Regulations
- it is time consuming — you may wish you had engaged a contractor!
- your lack of experience may cause operational inefficiencies
- you and any employees or helpers must have adequate safety training and possess the relevant Logging Operator's Certificate (*ask the Logging Investigation & Training Association*).
- all equipment and systems of operation must comply with Occupational Health, & Safety and Welfare legislation.

As already stated, in most cases, woodlot owners are generally well advised to engage a harvesting contractor; take it on only if you are sure you have the time, skill and equipment to handle some or all of the processes.

What should I know about harvesting supervision?

Helpful hints:

- work in with owners of nearby plantations to reduce the contractor travel costs
- when obtaining quotes bear in mind that the quality of work affects your returns as much as the price (*harvesting contractors are listed in Appendix 7*).

You should consistently supervise contractors to ensure that the harvesting contract is being followed, specifically with:

- agreed standards of harvesting
- product quality and quantity
- minimal tree and site damage levels
- on-time progress
- safe working conditions
- forest clean-up.

STEP 7: HOW DO I MEASURE THE LOGS AND GET PAID?

You can measure by volume or by weight.

Volume

The length and diameter of each log is measured. There is no fairer way, however it is costly and an independent measurer may be required to measure log loads as they leave the plantation. Posts and rails (preservation pieces) are counted and then converted to a volume figure using a standard volume conversion. A Procedure for the measurement of roundwood has been adapted from Forestry SA policy and is described in *Appendix 8*.

Weight

This is the simplest and most common method since all purchasers have access to a weighbridge and the weight note is independent evidence.

However, no premium is paid for larger diameter logs, so you should ensure that the price negotiated reflects the average log size. This can be done by measuring a representative sample.

You should ensure that logs are transported as soon as possible to avoid weight loss from drying out. One cubic metre of fresh pine logs weighs approximately one tonne.

How do I get paid?

A Log Note or Weight Note must be issued for each load of logs that leaves the plantation. It should include:

- date of loading
- owner and plantation identity



- product delivery location
- harvesting contractor
- transport contractor

Copies are provided to the owner, contractor and purchaser and are used as the basis for payment. See Appendix 8 for an example.

STEP 8: WHAT NEEDS TO BE DONE AFTER HARVESTING?

Cleaning up the site after a harvesting operation is sound management practice, ensures compliance with codes of practice and environmental guidelines and prepares the plantation for replanting.

You should make sure that:

- logging slash is well dealt with (for thinning operations, the logging slash should be allowed to rot in place and return nutrients to the soil; for clearfelling the larger sized pieces will usually need to be heaped into windrows and burnt)
- roads, watercourse crossings and drains are checked and maintained
- compacted areas such as landings should be ripped
- rubbish is collected and removed from the site by the logging contractor
- an inspection of the entire site is carried out before the contractor has departed with final payment withheld until any remedial work has been completed

HOW CAN I MAXIMISE THE RETURNS FROM MY PLANTATION?

Make sure you:

- work out the volume, products, their quality specifications/standards and value of wood?
- work cooperatively with other forest owners to:
- offer a more attractive quantity of wood to purchasers than any individual grower can
- negotiate better prices
- coordinate harvesting operations to negotiate better contract rates

- consider DIY harvesting, perhaps with a group sharing machinery and working together
- select the best trees to keep to maximise future profitability
- prepare a harvesting plan
- select contractors carefully and resolve to supervise and maintain high standards for
- claim costs against tax (*see Appendix 9: Taxation considerations*)
- ask for help!

WHERE CAN I GET HELP?

Forestry SA and Primary Industries and Resources SA provide advice on land suitability, species selection and plantation management and, most importantly, will help you get in touch with your local grower network.

Forestry SA is located at:

3/245 Fullarton Road
EASTWOOD SA 5063
Ph: (08) 8303 9900

Primary Industries and Resources SA offices are located at:

10 Dawson Street
GOOLWA SA 5214
Ph: (08) 8555 5366

State Flora

Bremer Road
MURRAY BRIDGE SA 5253
Ph: (08) 8531 1420

Regional Development Boards

The Adelaide Hills Regional Development Board and the Fleurieu Regional Development Corporation assist business development in the region by coordinating resources for a particular project and accessing government funding where appropriate. The boards are located at:

Adelaide Hills Regional Development Board
85 Mount Barker Road
STIRLING SA 5151
Ph: (08) 8370 8872

Fleurieu Regional Development Corporation
10 Dawson Street
GOOLWA SA 5214.
Ph: (08) 8555 5555



Australian Forest Growers (AFG)

Australian Forest Growers is a national voluntary organisation, with state and regional chapters, promoting private forestry in Australia with committees on communications, finance, taxation, insurance, marketing and research and development. Forestry SA can provide a local contact.

Logging Investigation and Training Association Inc. (LITA)

Provides training for chainsaw and harvesting machinery operation. They are based at:

PO Box 162
MOUNT GAMBIER SA
Ph: (08) 8725 9586

Forestry consultants

Professional consultants provide an independent and objective assessment of forest

management issues and are available to assist forest growers with plantation measurement and valuation, preparation of harvesting plans and harvesting and marketing of wood products. Depending on the service provided consultants may charge a fee based on an hourly rate or as a commission on the value of timber sold.

A list of forestry consultants can be obtained from Forestry SA or from the Yellow Pages.

Acknowledgments

Ministry of Forestry New Zealand and the New Zealand Logging Industry Research Organisation publications *Harvesting a Small Forest* 1996 and *Marketing a Small Forest* 1996 and Peter Bulman's publication *FarmTree\$ For The Mount Lofty Ranges* published by Primary Industries SA in 1995.



APPENDICES

APPENDIX 1: PRE-COMMERCIAL AND NON-COMMERCIAL THINNING

A. Pre commercial thinning (PCT)

- a PCT will:
 - reduce the amount of small-diameter roundwood from a woodlot
 - increase the growth rate of remaining trees by reducing competition
 - delay the first commercial thinning, increasing average log size and therefore improve log marketability
- you must plan ahead for a PCT because it is normally carried out at around 6 to 8 years, well before the time of a regular commercial first thinning
- the tree growth rate and density affect the timing of a PCT and so the best “rule of thumb” is a loss of vigour in the branches on the lowest 2 metres of the trees - this precedes the death of these branches and is marked by a thinning-out of the needles and a paler green in the needles that remain
- consider only woodlots standing above about 1300 trees per hectare for a PCT
- remove trees of low vigour and those substantially over-topped by the crowns of other trees - trees of poor stem form and/or with heavy branching should also be considered for removal
- do not remove extraction rows - these trees are best left to be part of the yield from the first commercial thinning
- after a PCT the tree density should range between about 800 and 1200 trees per hectare, depending mainly on tree height and initial stocking
- consider asking for professional advice when considering a PCT operation

B. Non-commercial thinning (NCT)

A non-commercial thinning is carried out with older trees, about the same age as a commercial first thinning.

PCT or NCT operations may be a realistic option for forest owners in the Mount Lofty Ranges where the market for small diameter sawlog is limited - Forestry SA plantations are pre-commercially thinned at an approximate cost of \$300 per ha with NCT operations costing substantially more.

APPENDIX 2: ESTIMATING TREE PRODUCTS AND THE VALUE OF YOUR WOODLOT

You will need to assess the volume and value of wood products in samples of your woodlot and then apply the estimates to the whole area. This is done by:

A. Locating tree measurement plots to cover the variation in quality of your woodlot according to the following criteria:

- **Plot area:** 0.05 ha (ie, about 25 x 20 metres)
- **Plot number:** 1 plot for every 2.5 ha of woodlot
- **Plot location:** locate the plot corners halfway between rows and mark with pegs taking care to avoid plantation edges. Where a thinning has been carried out the plot should include extraction rows, eg where this is every 5th row the plot would contain 8 tree rows and 2 extraction rows.

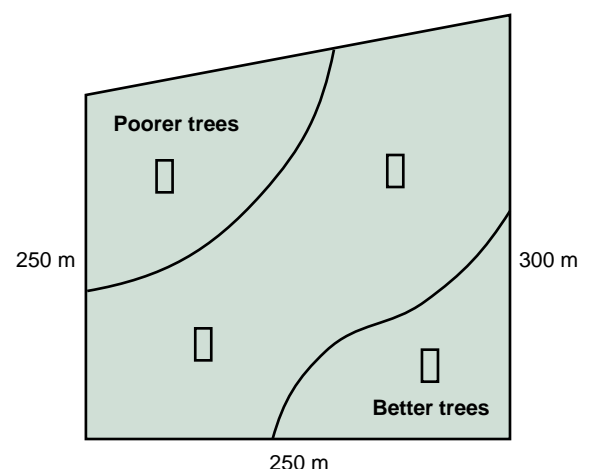


Figure 5: Locate tree plots to cover the site variation.



B. Calculating the product yield:

- estimate the number of log products in each plot
- using average log sizes, convert these numbers to a plot volume in cubic metres and multiply by 20 to calculate volume per hectare (see volume conversion figures in Appendix 8b, Table 5b)
- for clearfelling determine the volume in each stratified forest area, multiply by the relevant volume per hectare figure and then sum for the total volume of wood products
- for thinning estimate the log products only from those trees to be harvested (*see the section below on Which trees do I harvest?*)

- for a first thinning remember that all of the trees will be removed in the extraction rows (rows of trees, usually every 5th, removed to allow machinery access)

C. Estimating product value

To estimate the product value, multiply the tree volume by an average royalty figure from the Forestry SA Royalty Table, shown in *Appendix 3*.

Note: For an accurate assessment of harvesting yields and values you should obtain professional advice.

APPENDIX 3: FORESTRY SA ROYALTY TABLE

Mount Lofty Ranges Forests

Product	Diameter range (mm)	Diameter class	Royalty (\$/m3)	
SAWLOG	125 — 150	1	16.25	
	150 — 200	2	18.00	
	200 — 250	3	28.15	
	250 — 300	4	37.50	
	300 — 350	5	46.90	
	350 — 400	6	56.20	
	400 — 450	7	64.55	
	450 — 500	8	71.30	
	500 — 550	9	73.35	
	over 550	10+	75.40	
TREATMENT	Diameter range (mm)	Diameter class	Short length (<3 metres) Royalty (\$ per m3)	Poles (> 3 metres) Royalty (\$ per m3)
	75 — 125	0	19.10	23.85
	125 — 150	1	23.10	28.90
	150 — 200	2	27.20	34.00
	200 — 250	3	45.95	57.45
	over 250	4+	67.60	84.50



APPENDIX 4: ROUNDWOOD PURCHASERS IN THE ADELAIDE REGION

Recut Industries MONARTO 5254 Ph: (08) 85344004	Short and long length sawlog (150-650 mm) and preservation
Brown Wood Panels 107 Mooringe Ave PLYMPTON 5038 Ph: (08) 82943877	Plywood 3.9, 4.2 and 5.5 metre lengths Minimum log diameter of 300 mm and specific knot requirements Premium price paid for clear wood
Victor Harbor Sawmill VICTOR HARBOR 5211 Ph: (08) 85366043	Short and long length sawlog Maximum diameter of 500 mm
Campbelltown Timber Mill 62 Millers Rd WINGFIELD 5013 Ph: (08) 83470391	Short & long sawlog (some poorer "break" quality log)
Kuitpo Sawmill Wickhams Hill Rd MEADOWS 5201 Ph: (08) 83883320	Mainly long length sawlog
Bill Dalitz MT COMPASS 5210 Ph: (08) 85568408	Short and long length sawlog
Nuriootpa Sawmill NURIOOTPA 5355 Ph: (08) 85621327	Short and long length sawlog
A&J Wilson P/L WILLIAMSTOWN 5351 Ph: (08) 85246544	Short and long length sawlog
Tarmac (SA) Pty Ltd 51 Kincaid Avenue NORTH PLYMPTON 5038 Ph: (08) 82958356	Preservation material



APPENDIX 5: PRODUCT SPECIFICATIONS

Agree on written product specifications with the purchaser as part of any sale arrangement. General specifications have been obtained from *Forestry SA* for sawlog and serve as a general guide to growers. These would need to be developed specifically for each purchaser and include preservation and plywood requirements. Sawlogs may be downgraded in value by excessive knots, large knot size and log sweep or bends.

Table 4: Sawlog Specifications (general) — Forestry SA.

Source:	Logs shall be cut from green standing <i>Pinus radiata</i> aged 17 years or more				
Diameter:	Minimum, small end underbark = 150mm Maximum, large end underbark = 900mm				
Log lengths:	Primary lengths 3.6, .4 and 6.0 metres plus s up to 100mm length tolerance				
Length docking:	Logs shall be cleanly docked to within 5 degrees of square to the longitudinal axis of the log End splits are permitted provided they do not exceed 150mm in length Butt tears and sloven ends are not acceptable				
Trimming:	Branches to be trimmed to within 35mm of the log surface with bark on, or 50mm if assessed after debarking, although 2 branches to a maximum of 75mm and 100mm respectively will be allowed				
Knot size:	Individual knots less than 100mm in diameter measure at 90° to the longitudinal axis of the knot are permitted; a log may have up to one knot up to 150mm in diameter, but none greater than 150mm.				
Log form:	Logs shall be accepted if sweep is a uniform bow in one direction and shall be measured as millimetres of deflection from a straight edge laid alongside the log. The maximum allowable amount of sweep will vary with log diameter and length, as per the following:				
		Deflection (mm)			
	Small end diameter (mm)	Log Length (mm)			
		3.6	4.9	5.5	6.1
	150—299	60	75	80	80
	300—399	70	90	95	100
	400—499	75	100	110	120
	over 500	85	110	125	140



APPENDIX 6: ELEMENTS OF A FOREST HARVESTING PLAN

Forest Inventory Data

Total *volume* will affect:

- markets
- the cost effectiveness of roading
- other overhead costs

Types and sizes of products will determine:

- markets
- choice of machinery
- timing of the operation

A site checklist

Check the following:

- public road access for contractors
- access to the site from public roads — look for bridge and road upgrades
- Government regulations
- access within a plantation — roads, landings and drainage
- effect of topography on harvesting
- fencing and stock control provisions
- historic and cultural values
- adverse ground conditions
- watercourse management areas
- adjacent residential areas
- terrain (this dictates machinery and systems)
- public access
- powerlines
- fences
- natural hazards

Statutory Regulations and Codes of Practice

Ensure compliance with:

- Soil Conservation Act (1989)
- Water Resources Act (1997)
- Native Vegetation Act (1991)

- Occupational Health, Safety and Welfare Act (1995)

- Logging Regulations

- Codes of Practice

- District Council Requirements

Selection of appropriate equipment

This will be determined by:

- access

- terrain

- site restrictions

- products and volume

- distance from purchaser

Harvesting and marketing contract

A written agreement protects the interests of all parties concerned and should include a Sale and Purchase Contract and Harvesting and Transport Contract.

Sale and Purchase Contract describes the:

- estimated product volume
- product specifications
- time-frame, including seasonal restrictions
- price and measurement procedure
- invoicing and payment conditions

Harvesting and Transport Contract describes the:

- harvesting plan
- price and measurement procedure
- invoicing and payment conditions
- adherence to codes of practice & statutory regulations
- performance requirements
- tree marking standards



APPENDIX 7: PRINCIPAL LOGGING CONTRACTORS IN THE MOUNT LOFTY RANGES

Hunter Logging Basket Range Rd URAIDLA 5142	(08) 83901296	014 844539	Neil Hunter
Damilown P/L Wickhams Hill Rd MEADOWS 5201	(08) 83883539		Colin Gordon
T. Paech Moculta Rd ANGASTON 5353	(08) 85643199		Trevor Paech
Doug Buttery Bull Creek via MEADOWS 5201	(08) 85366043		Doug Buttery
NF McDonnell & Sons MOUNT GAMBIER 5291	(08) 87258888	018 838365	Ian McDonnell
Kevin Weinert LOBETHAL SA 5241	(08) 883896080		Kevin Weinert
Smith Brothers WILLIAMSTOWN SA 5351	(08) 85246204		Ivan Smith

APPENDIX 8A: LOG MEASUREMENT PROCEDURE, FORESTRY SA

Product: Long Log (logs 3.0 metres or more in length) - see Table 5a for a sample recording and calculation form.

1. Measure the log length and record it as the set length (to the nearest 0.1 metre).
2. Measure the diameter class of both ends of each log using a scaled ruler, mark the number on the end of the log and record it on the measurement form.
3. Total the number of ends in each diameter class for each log length and check the number of logs on the load with a physical count of all of the logs.
4. Calculate the load volume is determined by multiplying the number of ends in each log class by the log length and the class constant which is relevant to a particular diameter class (see Table 5b). The sum of the individual diameter class volumes is the total volume of the load. (Woods and Forests Forestry Manual - 1987).
2. Measure the diameter class of the logs one end only with a scaled ruler, mark the number on the end of the log record the diameter class on the measurement form.
3. Total the number of ends in each diameter class for each log length and check the number of logs on the load with a physical count of all of the logs.
4. Calculate the load volume by multiplying double the number of ends in each log class by the log length and the class constant which is relevant to a particular diameter class (see Table 5b). The sum of the individual diameter class volumes is the total volume of the load.

Product: Preservation - see Table 5a for a sample recording and calculation form.

Product: Short Log (logs less than 3.0 metres in length) - see Table 5a for a sample recording and calculation form

1. Measure the log length and record it as the set length (to the nearest 0.1 metre)
2. Measure the pieces on one end only (theoretically the small end) with a scaled ruler and record the diameter class on the form
3. Calculate the volume of each product by multiplying the number of pieces, in a



particular length and diameter class, by the volume per piece.

4. To allow for the fact that all measurement is not all small end, ie the one side of a load measured usually contains large and small ends, the actual cut-off diameter between the size ranges 75-125 and 125-150 has been adjusted for various length products (see Table 5c).

Irregularly Shaped Ends - normally applies to larger diameter sawlog.

- (a) Fluted end, - imagine a circle drawn on the butt as shown in Figure 7a, and the axis of the circle is measured.
- (b) Not circular, - measure between the long and short axes as shown in Figure 7b.
- (c) Sloping cut, - measure along the short axis as shown in Figure 7c.

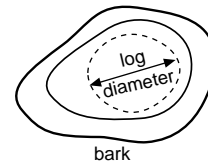


Figure 7a: Measure the axis of an imaginary circle drawn on the butt end.

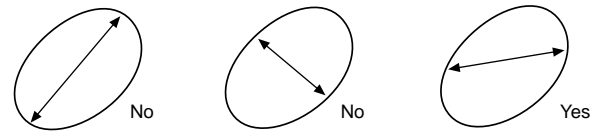


Figure 7b: Measure between the long and short axis.

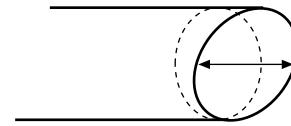


Figure 7c: Measure across the sloping end.



APPENDIX 8B: ROUNDWOOD MEASUREMENT TABLES

Table 5a: Measurement Recording Form

PRODUCT:..... LENGTH: metres

Diameter range (mm)	Diameter Class	Number of ends	Class Constant	Volume (m3)
125-150	1		.004	
150-200	2		.007	
200-250	3		.012	
250-300	4		.020	
300-350	5		.030	
350-400	6		.041	
400-450	7		.055	
450-500	8		.071	
500-550	9		.089	
550-600	10		.108	
		Total ends	Total volume	

Purchaser Owner Pltn Date

Measurer Falling Extraction Transport

Truck No Contractor Contractor Contractor

Table 5b: Diameter Class Constants for Roundwood

SAWLOG				PRESERVATION				
Diameter range (mm)	Diameter class	Class Constant (for 2.5m log)	Pieces per m3	Length	Diameter range (mm)	Diameter Class	Class Constant	Pieces per m3
125-150	1	0.004	50	1.8	75-125	0	0.016	62.5
150-200	2	0.007	28.5		125-150		10.029	34.5
200-250	3	0.012	16.7	2.1	75-125	0	0.019	52.6
250-300	4	0.020	10		125-150		10.034	29.4
300-350	5	0.030	6.7		150-200		20.057	17.5
350-400	6	0.041	4.8	2.4	75-125	0	0.022	45.5
400-450	7	0.055	3.6		125-150		10.039	25.6
450-500	8	0.071	2.8		150-200		20.062	16.1
500-550	9	0.089	2.2	3.0	75-125	0	0.028	35.7
600	10	0.108	1.8		125-150	1	0.050	20.0
					150-175	2	0.078	12.8
				3.6	75-125	0	0.035	28.5
					125-150	1	0.061	16.4
					150-175	2	0.096	10.4
				4.2	75-125	0	0.042	23.8
					125-150	1	0.072	13.9
					150-200	2	0.114	8.8

Table 5c: Measurement adjustment between the 75-125 and 125-150 mm diameter ranges

Length (metres)	Actual Measured Diameter Cut-Off (mm)
1.8, 2.1, 2.4	132
3.0, 3.6	136
4.2	142



APPENDIX 9: TAXATION CONSIDERATIONS

Under Section 51(1) of the Income Tax Assessment Act 1936 costs incurred to produce a taxable income from commercial tree planting are fully deductible in the year of expenditure.

These can include:

- woodlot site preparation, tree planting and tending
- felling and transporting trees
- site cleanup following logging.

Roading is depreciated over the number of years the road is likely to be used for forestry.

Fencing is depreciable at 7% of the prime cost per year.

Eligibility is specifically covered in:

Taxation Ruling 95/6, Income tax: primary production and forestry — deals with the extent to which receipts derived from the sale of timber constitute assessable income and the deductions allowable in respect of that income.

Taxation Ruling 97/D1, Income tax: am I carrying on a business of primary production? — provides a guide of the indicators that are relevant to whether or not a person is carrying on a business of primary production.

Draft Sales Tax Determination 96/D1, Vehicles used in Forestry activities — examines sales tax exemptions for certain classes of vehicles used in forestry activities.

