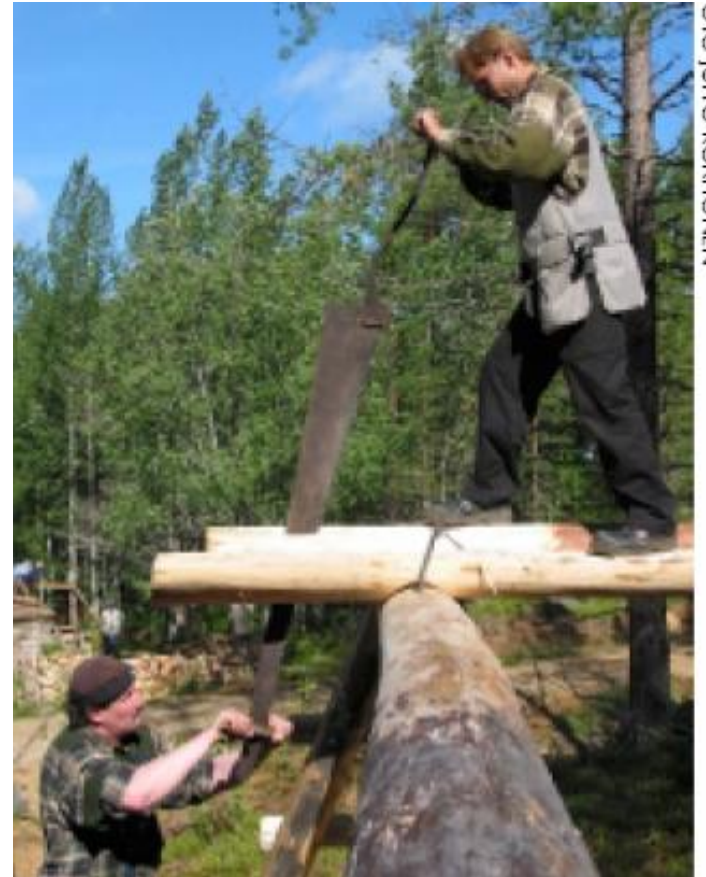


Sawmilling -on the move

Gary Waugh

Timber Training Creswick

Ph: 0439 988 040 email: garyx.waugh@bigpond.com



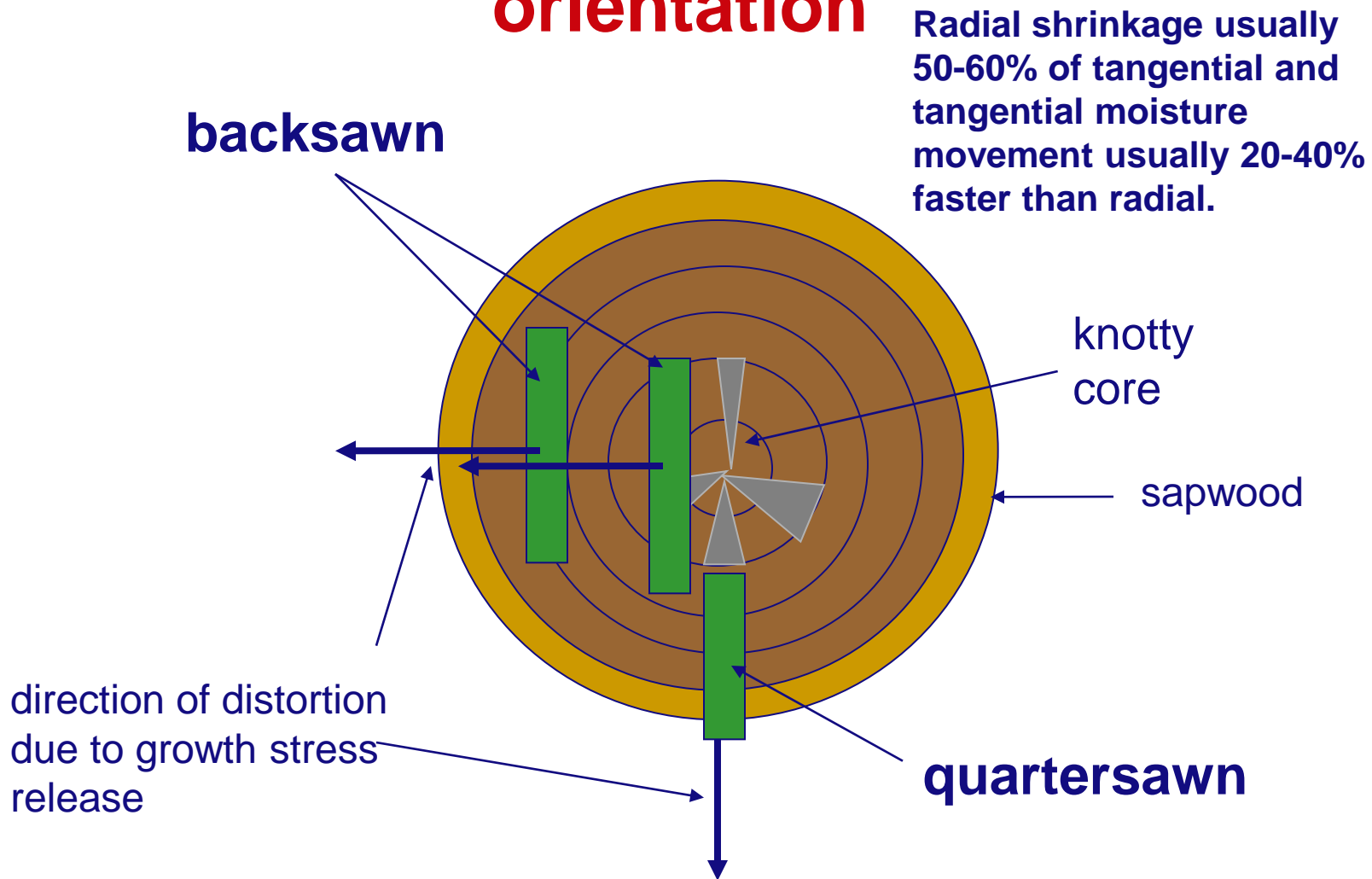
OTO JUHO KORHONEN

Options

Factors influencing choice:

- Capital availability
- Resource characteristics
 - Species, log diameter and quality
 - Location and concentration of supply
 - Volume availability
- Markets
 - Location, volume and quality required
 - Customers
- Labour availability and skills
- Local back-up for spares, training

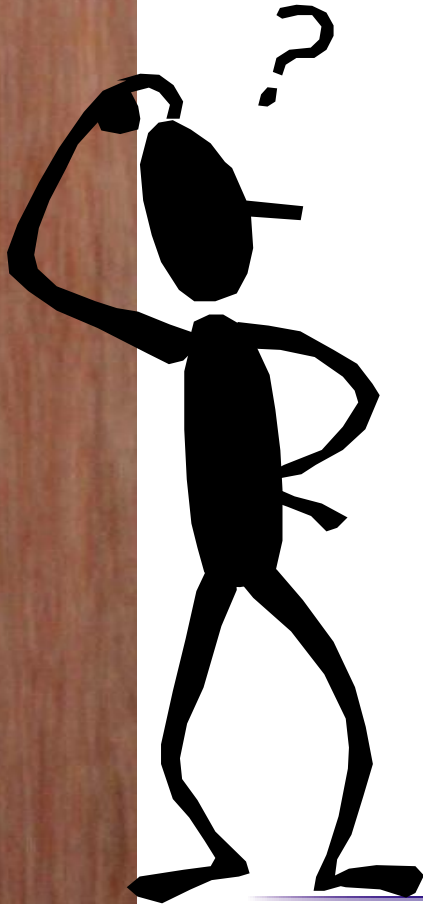
Critical processing and performance elements associated with product orientation



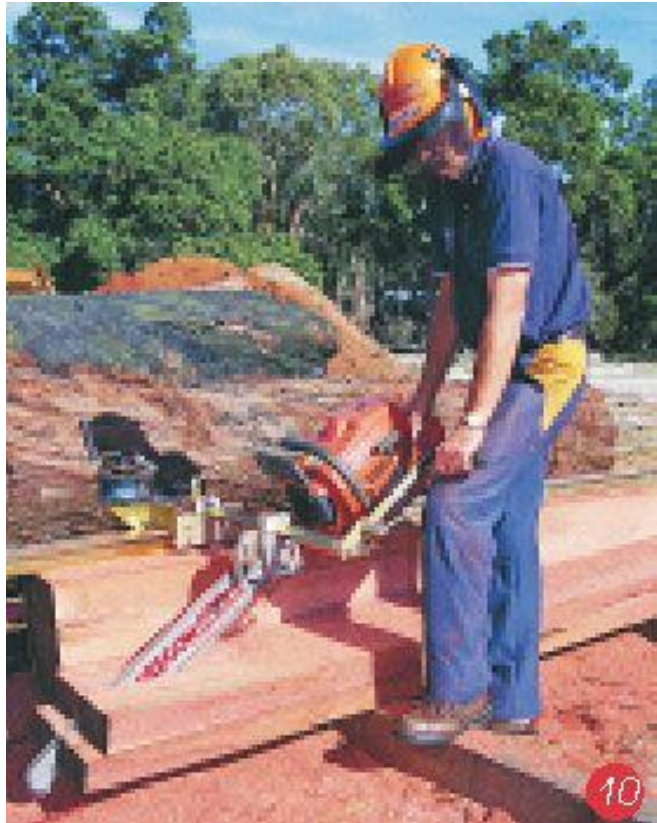
Sawmilling equipment options

Wide selection of systems:

- Portable sawmills:
 - Chainsaw powered
 - Traveling bandsaw
 - Traveling circular saw
 - Fixed circular saw
- Fixed location sawmill
 - Second-hand
 - New, green-field sawmill



Ultra-portable Chainsaw sawmill



- Extremely portable
- Low cost
- Poor productivity and often considerable physical effort required by operator
- Cut depth only limited by cutter bar length. Sawing strategies similar to horizontal bandsaw units
- Large kerf
- OH&S care



Traveling horizontal bandsaw **Wood- Mizer L28**

- Portable
- Wide range of models
- Can achieve wide saw cut
- Lack of flexibility with sawing strategies

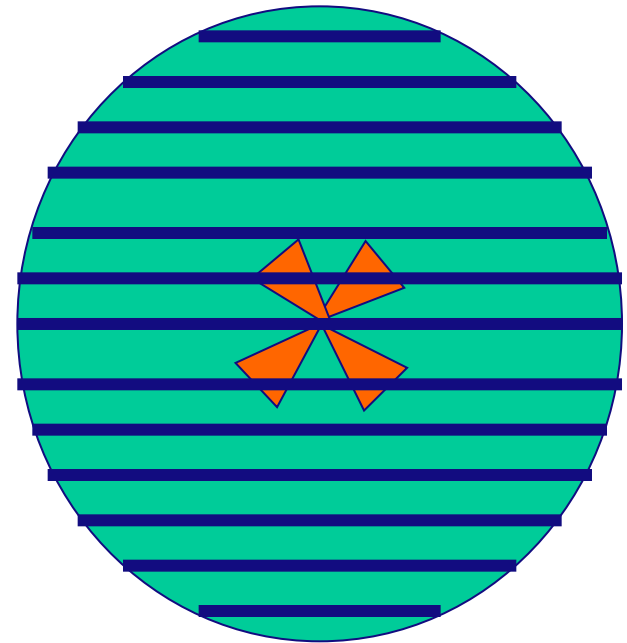
Live (through and through) sawing strategy

Commonly used for Northern Hemisphere hardwoods
sawing parallel with
heart (no taper)

Easiest strategy with
horizontal bandsaw

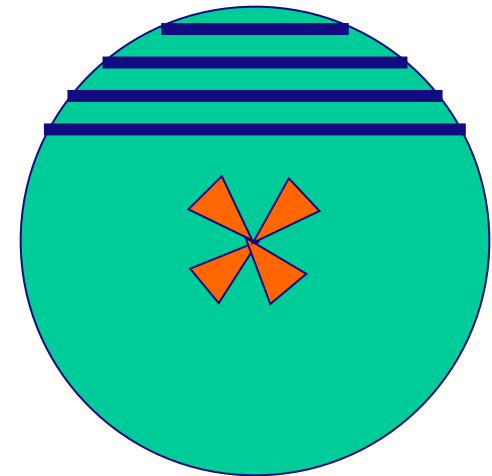
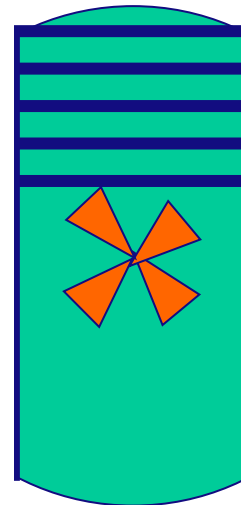
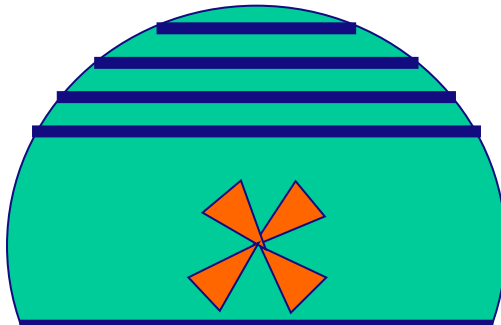
But:

- Products of mixed back- and quartersawn orientation
- Does not handle growth stress very well



Backsawing strategy for portable horizontal bandsaw

1. Saw parallel with taper to 1/3 log diameter
2. Turn and repeat



3. Turn and repeat to box out heart

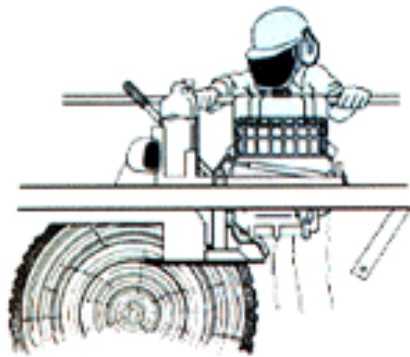


Traveling circular saw Lucas saw

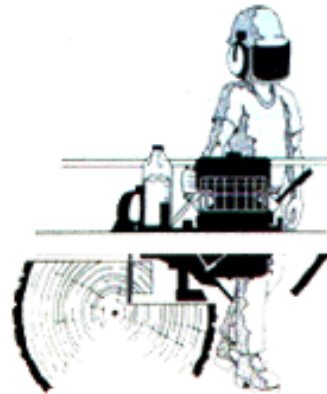
- Portable
- Can handle large diameter logs
- Range of models and attachments
- Local support – hardware and training
- Wide flexibility with sawing strategies for both quarter and backsawing

Source: www.lucas.com.au

Lucas mill strategies

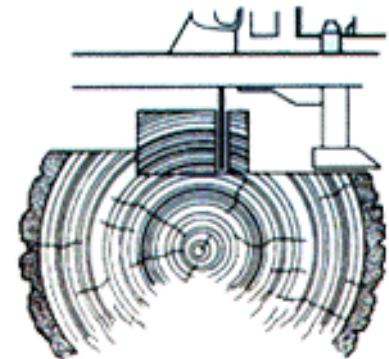


Horizontal cut on
forward pass



Vertical cut on return

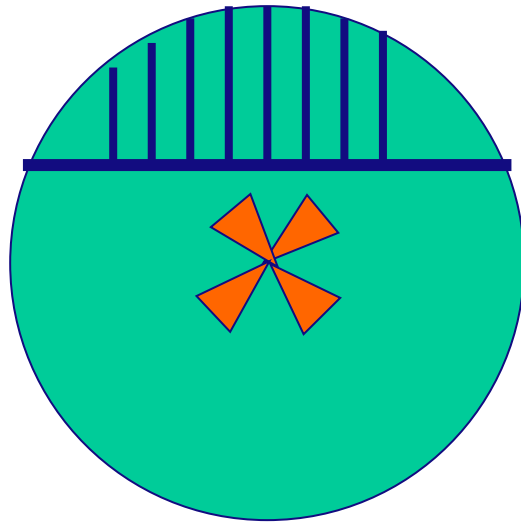
Use of partially sawn log as a base
for resawing and straightening cut
for distorted pieces



Source:
www.lucas.com.au

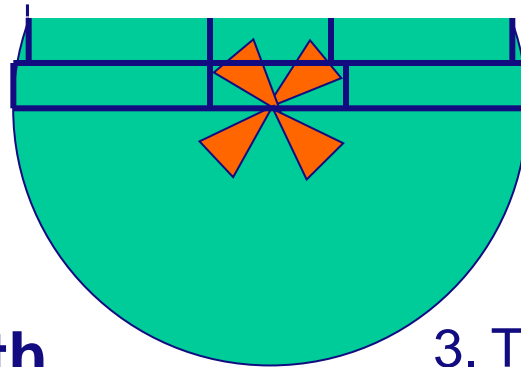
Lucas saw strategies

Quartersawing



**sawing parallel with
heart (no taper)**

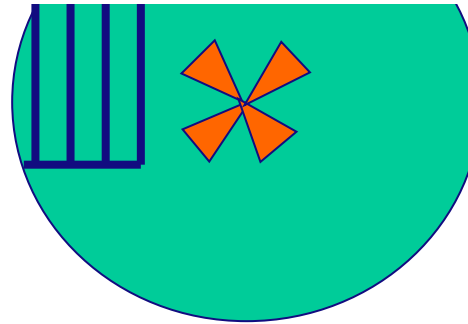
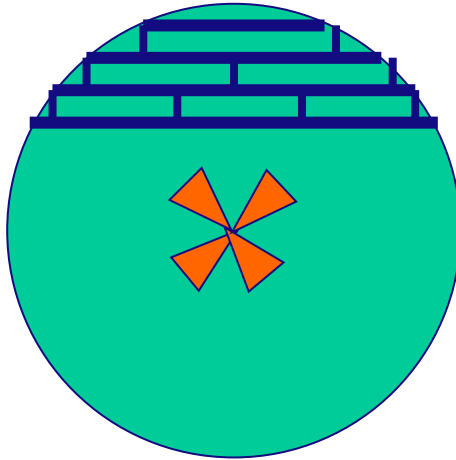
1. Open with deep horizontal cut and slab off quartersawn product.
2. When more than $\frac{1}{3}$ through log change to horizontal cut depth of product thickness



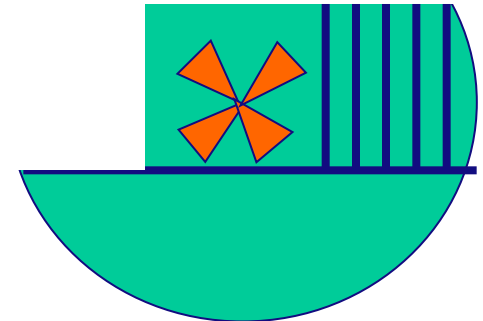
3. Turn log over and repeat for step 1

Backsawing

1. Commence with horizontal cut depth for product thickness and cut until $\frac{1}{3}$ log diameter
2. Change to horizontal cut for product width



3. Cut from other side, box out heart, turn log over and repeat step 1



High-production fixed saw Kara F2000 sawmill



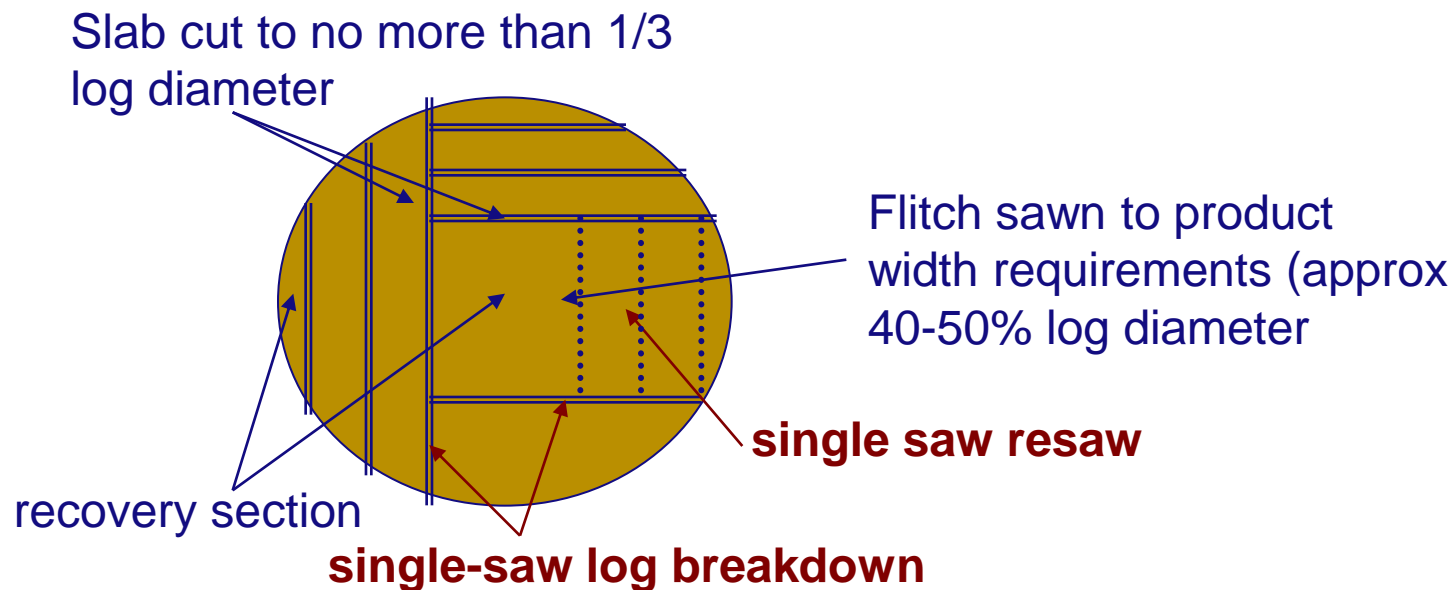
Many of the features of a conventional sawmill

- Log break-down and hob-feed resawing
- 400 mm maximum diameter (depending on model)
- Sizing system
- Similar and flexible sawing strategies
- High productivity
- Considerably more expensive than other systems

Conventional sawmill – Kara mill

Strategy for backsawing logs 250-350 mm diameter

**Objective of strategy: progressively
relieve growth stress and maximise
backsawn product output**



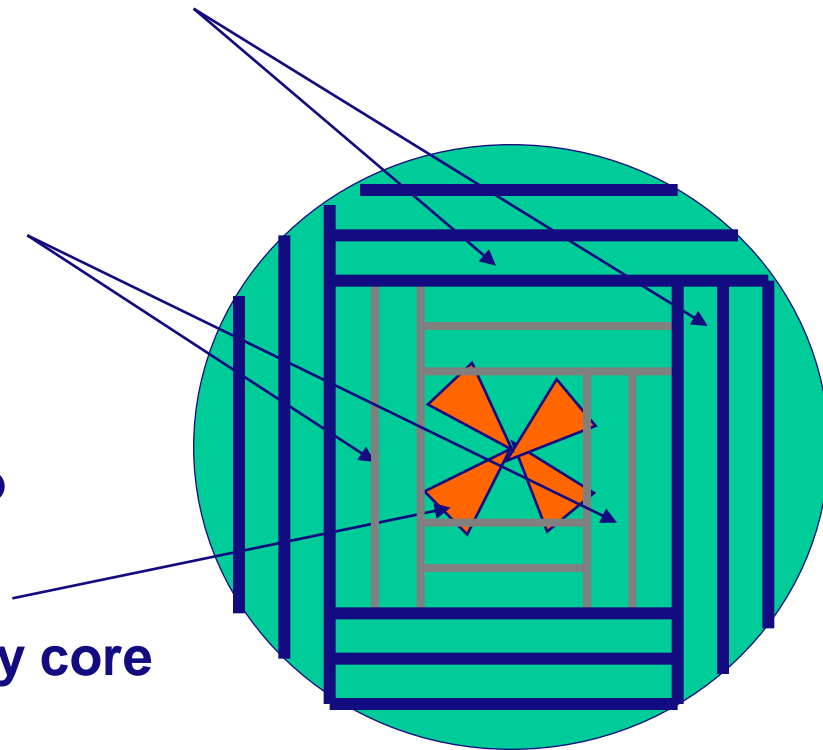
Traditional back-sawing strategy for single saw log carriage system for maximum quality recovery

primary log breakdown cuts

resawing cuts

Can saw parallel with bark (taper saw), parallel with heart (no taper), or anywhere between

knotty core



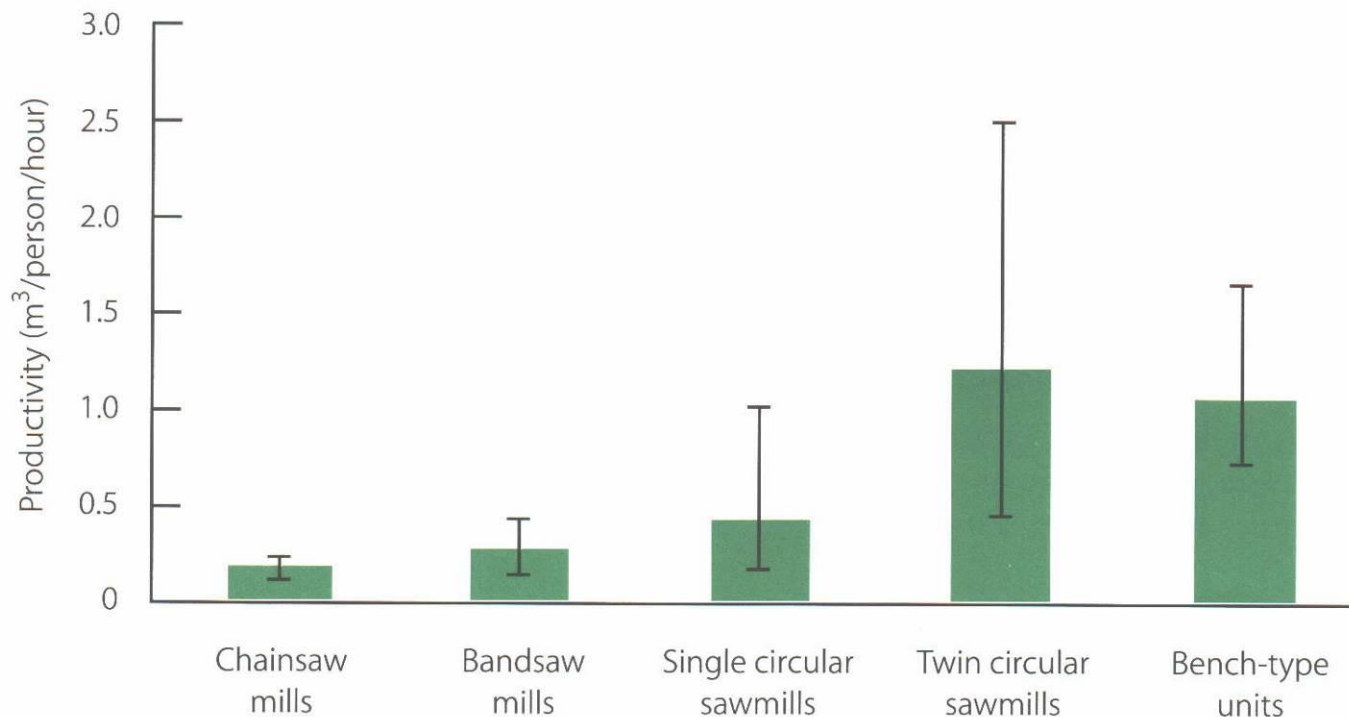
Main advantages of Different Portable Sawmills

Sawmill category	Main advantages
Chainsaw mills	Rugged and relatively inexpensive
Horizontal bandsaw mills	•Extremely portable
	•Safe
	•Increased timber recovery
	•Simple production of slabs and wide boards
Single circular sawmills	•Competitive prices, good value for money
	•Able to handle difficult timbers
	•Relatively low amount of sawlog handling required
Twin circular sawmills	•Powered saw carriage reduces physical work required
	•Sawn timber return facility reduces labour requirements
Bench-type units	•High productivity makes it suitable for large volumes of low value timber

www.rirdc.gov.au

From Stewart and Hanson

Productivity of different portable sawmill systems



www.rirdc.gov.au

From Stewart and Hanson

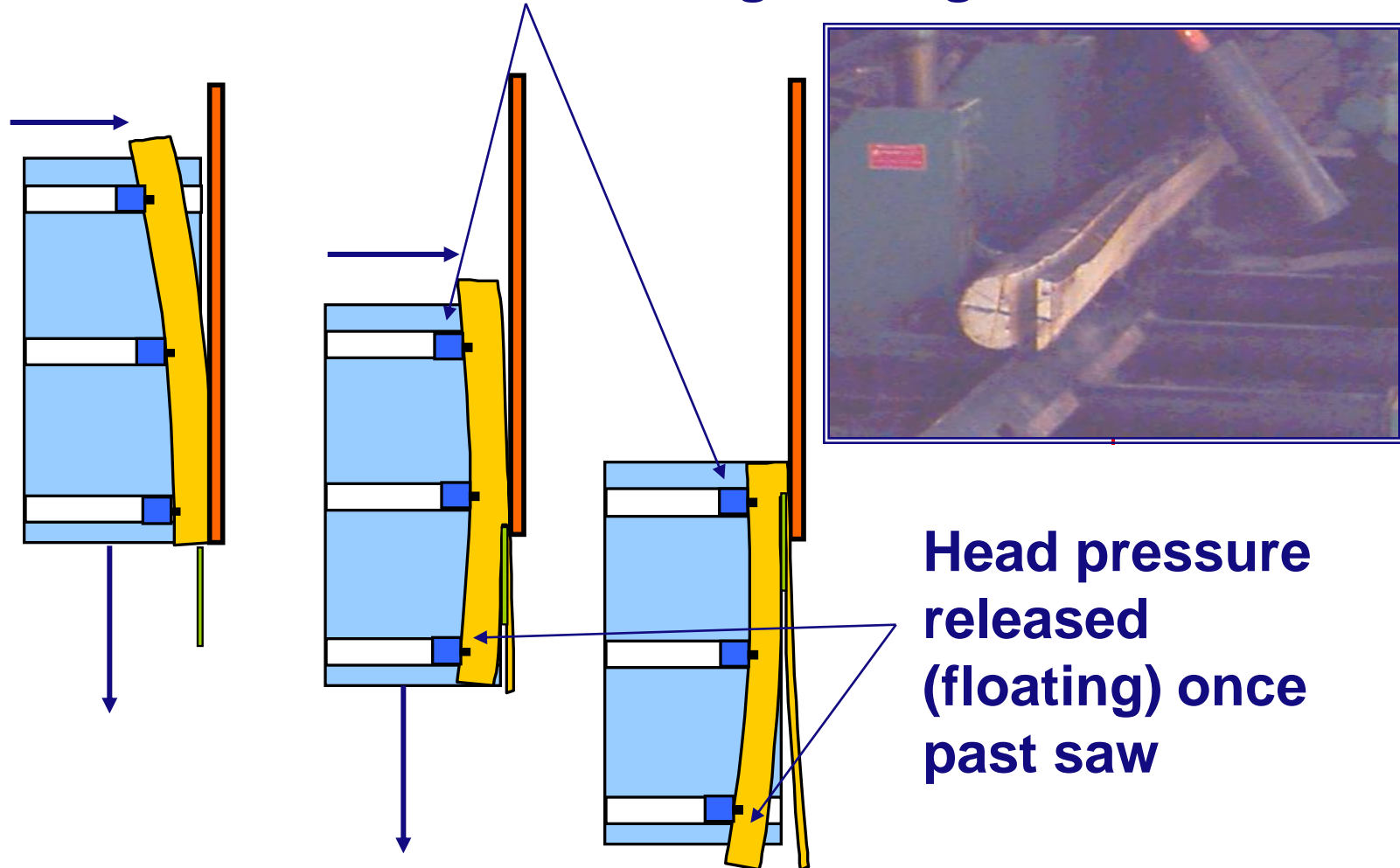
Conventional sawmilling systems



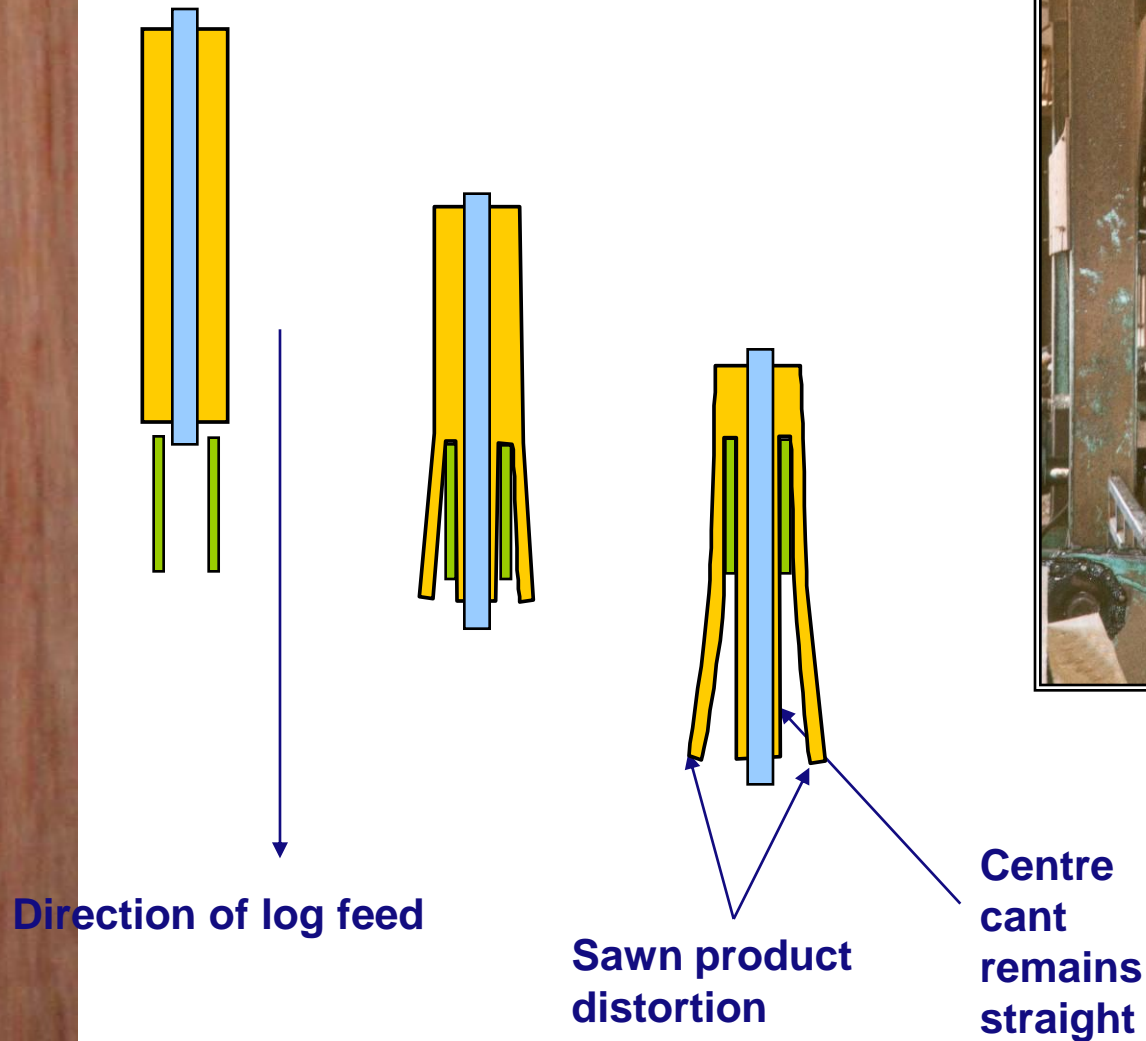
- Higher capital cost and maintenance
- Needs larger resource volume to justify investment
- Higher productivity
- Training systems in place

Linebar sawing

Rear head advanced during sawing



Twin saw system

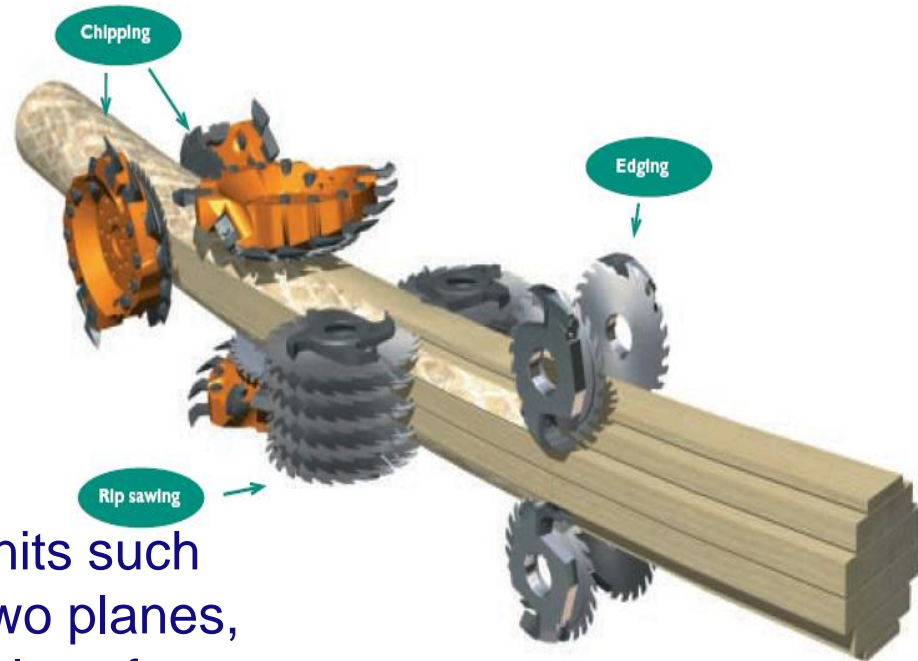


Balances stresses in horizontal plane but increased stress gradient in vertical plane.

The other extreme: Multiple saw systems

Hewsaw R200

Profiles log and multiple saws in one plane. Best suited for logs 150 to 250 mm diameter

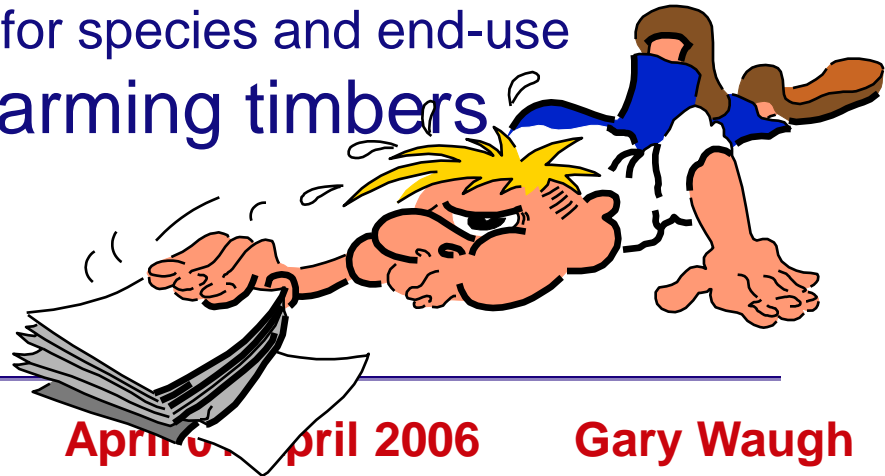


Other multi-station units such as R250 duo cut in two planes, can handle sweep in logs for logs up to 350 mm diameter

Marketing

Comparatively low volume production and high cost

- Therefore have both the opportunity and necessity to seek specialty markets
 - Specialty resource (species, burls), dimensions (wide table-tops) and end-use (colonial furniture, durable decking)
 - May need to look at wood drying
 - Specialised small-scale systems available
 - eg solar dryers
 - Training availability for species and end-use
- Alternative – local farming timbers



Future sawlog resources

Opportunities with intensively-managed eucalypt

- They can be used for a wide range of products and at a very young age
- They can achieve a very fast growth rate and have the potential to be grown even faster
- Have proven adaptability to an extreme range of environmental conditions in many countries



**Table and chairs
from 10-year-old
E. camaldulensis
- Thailand**

The South Americans believe there is a great future

They have:

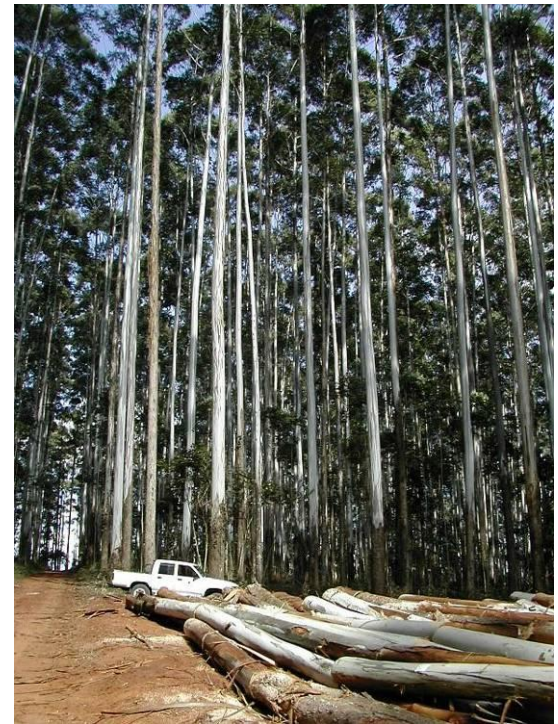
- a high quality resource
- skilled and low-cost labour

And are:

- Introducing best practice processing
- Implementing training
- Developing transport infrastructure
- Pursuing international markets

Plantation (20 years)

E. grandis
ready for harvesting –
Telemaco,
Brazil

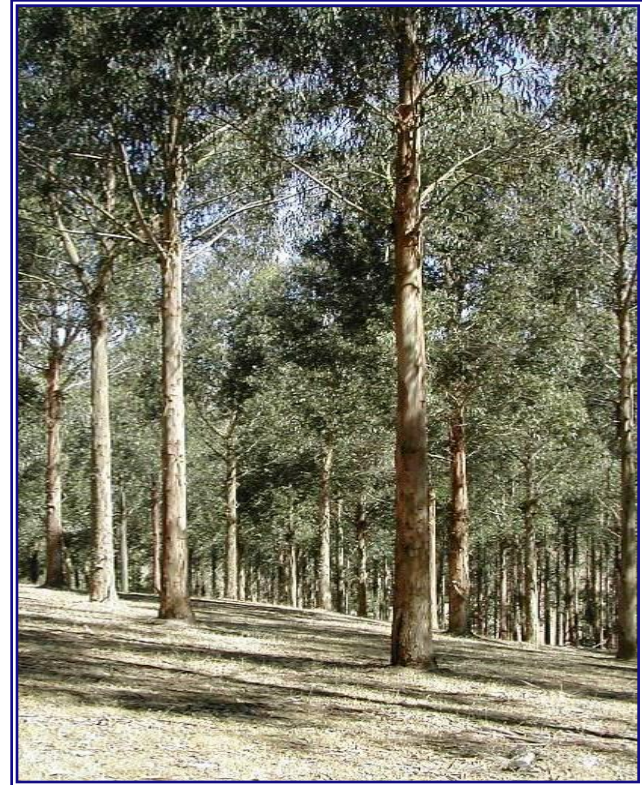


Sawn from 8 year-old tree (Uruguay)– E. Shield

E. globulus different silvicultural treatment

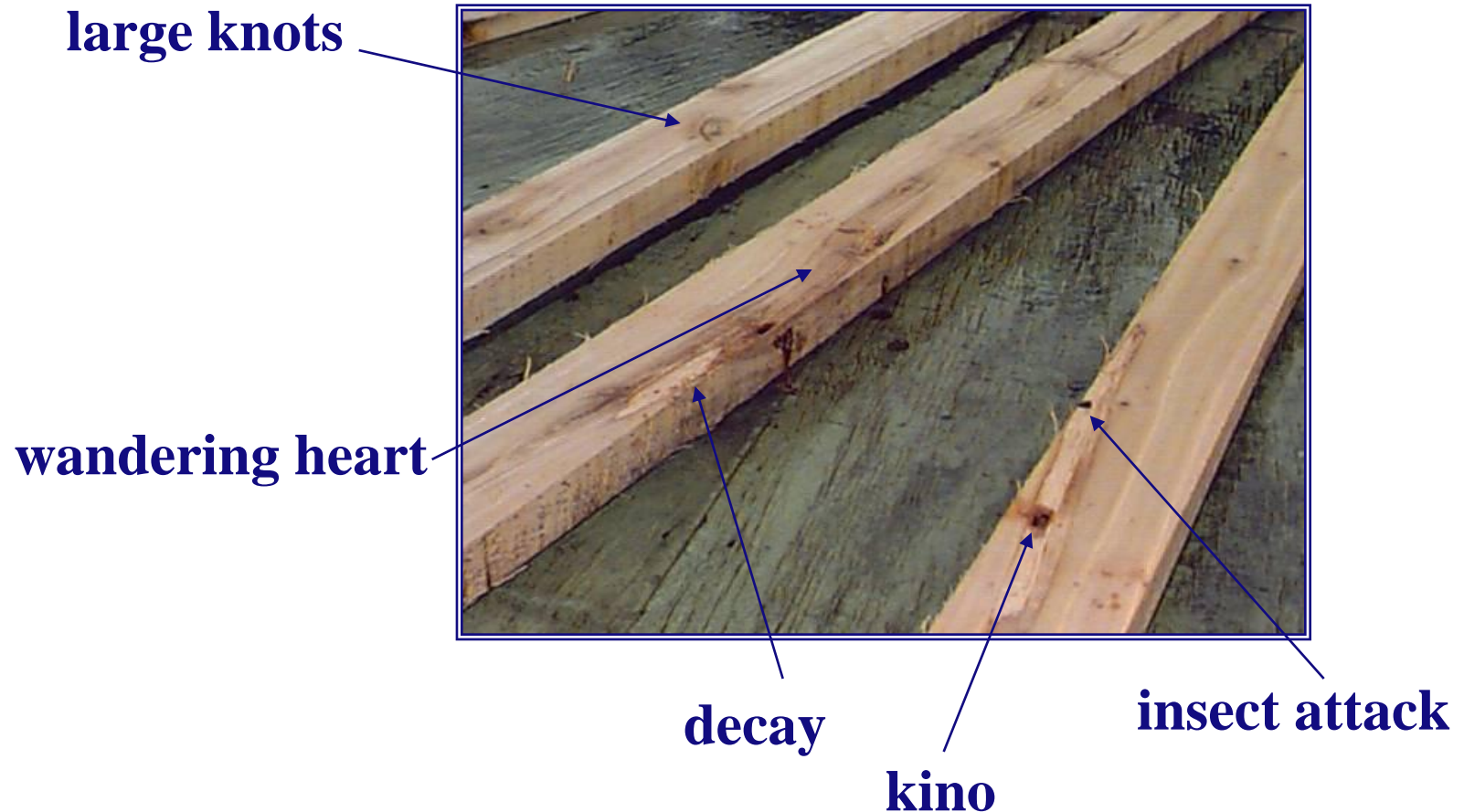


10 year-old, Mt Gambier
(later harvested age 14 year)



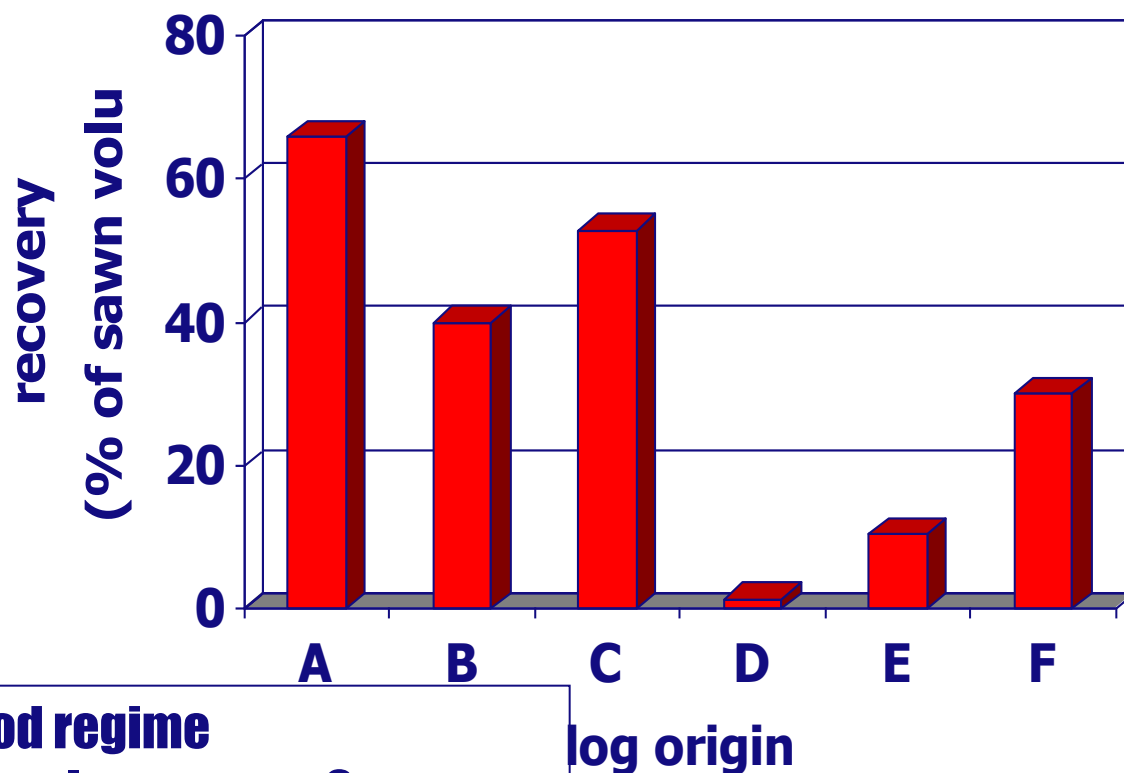
12 year-old, South Gippsland

Examples of defect in sawn products from 14-year-old *E. globulus*



Planted *E. globulus* resource quality

**Select
appearance
product
recovery**



12-year-old clearwood regime

A-butt log

B-top log

C-average

D- 14-year-old, thinned at 10, no pruning

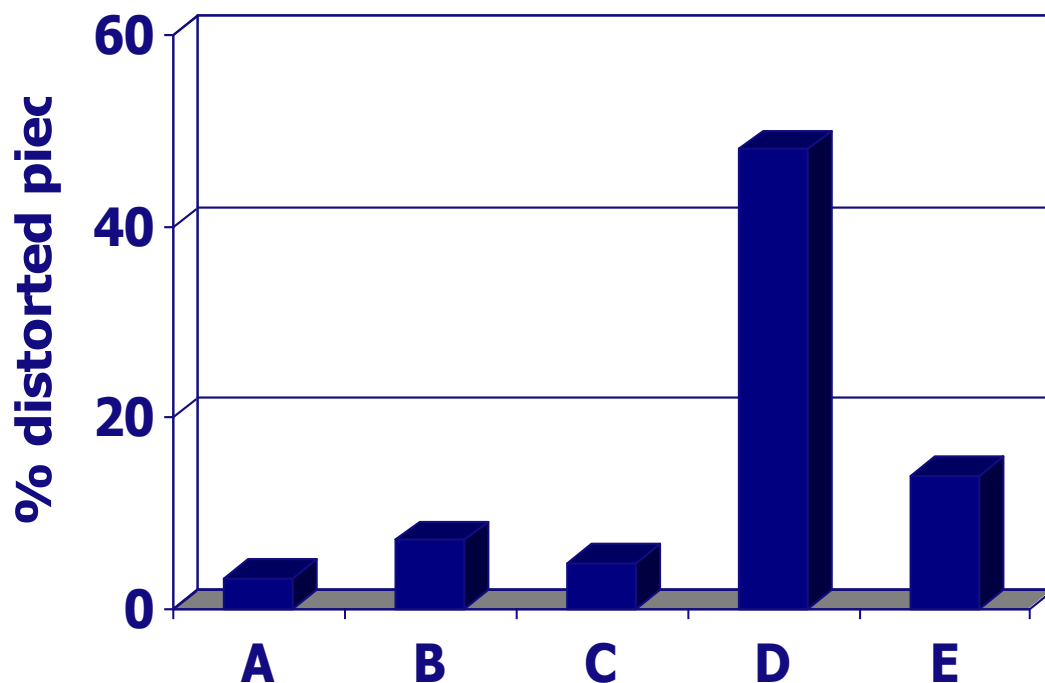
E- 8-year-old, pruned and thinned at year 4

F- 62-year-old, *E. regnans* regrowth

Planted *E. globulus* resource quality

Product distortion

***Spring or bow
exceeded minimum
product
specifications**



12-year-old clearwood regime

A-butt log

B-top log

C-average

D- 14-year-old, thinned at 10, no pruning

E- 8-year-old, pruned and thinned at year 4

log origin

Sawn products from planted *E. globulus*



Managed to a
clearwood regime
(heavy early non-
commercial thinning,
20 year rotation, NW
Spain)

(courtesy C. Baso and E. Shield)



Choice of effort???

Intensive management or processing?

Depend on resource and markets:

- Suitability and response of species for intensive management – eg clearwood regime
- Regional intensity of planting
- Specialty needs in processing
- Existing regional processing and suitability to process and market your wood
- Value of logs
- Ability for expanding effort – cash flow





**12-year-old intensively managed *E. globulus*,
Australia**

Photo: Phil Blackwell