

## Peeling coconut



The challenge of peeling coconut stems for high-quality veneer.



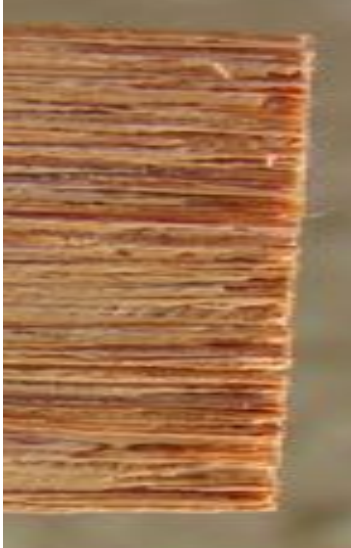
*Thanks to Rob McGavin and the QDAF team for the base presentation content.*

## Content



- The challenge of peeling coconuts
- ENSAM trial results.
- Implementing results in commercial and research trials.
- Take home messages for successful coconut processing.

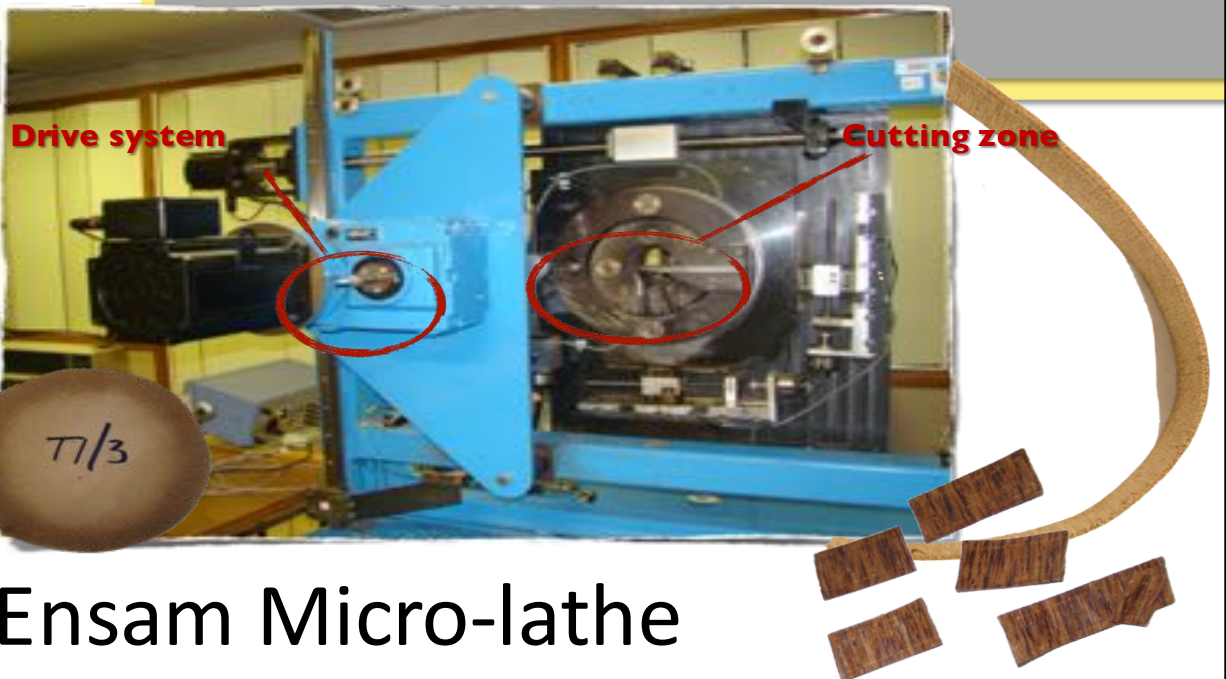
## Complexity in veneering



The key challenges include:

- Slicing the hard vascular bundles without undue damage to the surrounding soft matrix.
  - To manage surface coarseness & reduce sheet damage.
- Recovering useful material from small diameter logs.
- Accommodating varying density across the log.

Controlled spindleless lathe approaches offered a possible solution.



Ensam Micro-lathe

## Conclusion on the best settings



- Heating of discs to a temperature 80 °C for 1hour.
- Cylindrical bar pressure
- Pressure sufficient for 10% veneer compression.

The implementation on a production lathe requires a relatively large diameter, cylindrical nose bar in order to make the pressure more uniform.

## Peeling trials - initial



Advanced veneer and other product from coconut wood

## Peeling trials - initial

### Initial experimental peeling trial in Fiji

- Lathe performed well
- 23 logs (1.5 m<sup>3</sup>) processed, 249 veneer sheets produced.
- Around 60% recovery
- Supporting equipment problems: pretreatment chamber couldn't heat logs sufficiently!
- Veneer quality negatively impacted by:
  - Lack of log heating capacity.
  - Lack of opportunity to optimise lathe settings.



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## VTB commercial peeling trial



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### Compact commercial peeling trial in Fiji

- 171 of 2500mm billets processed.
- About 15 m<sup>3</sup> of veneer produced.
- No drying challenges.
- Good quantity of suitable quality veneer for product development activities.
- Equipment issues demonstrated the challenges of peeling coconut.
- Equipment performance and surface quality issues reinforced the necessity of billet pre-conditioning.

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## Further peeling trials at TUD, Suva

Additional log heating capacity was installed.



## Heating assessment



## Peeling heated logs with improved settings



## Improved peeling quality observed



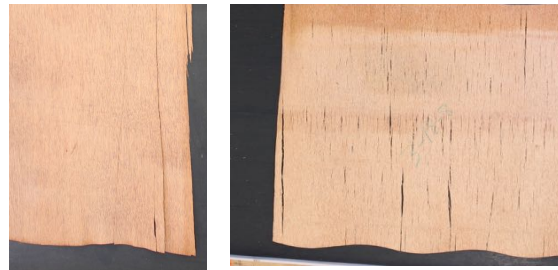
Veneer grade recovery and quality through the log currently being assessed.



## Veneer grading

Recovered coconut veneer was graded but this presented challenges.

- The major grading criteria for wood species don't relate well to coconut.
- Grade-reducing characteristic common for wood species in the standards don't apply to coconut.
  - The basic characteristics of the coconut veneer vary considerably and need be included in
- Some desirable features of coconut, such as density, are not prominent or included.
- Production-induced characteristics can dominate grading if not controlled during production.



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## Peeling summary

Rotary veneer processing presents several advantages over conventional sawing. These include:

- Recovering around double the usable product from logs.
- Much higher recovery from the periphery of logs.
  - In coconuts, this can have the most attractive characteristics and properties.
- Easier management of the log's variable properties.
- Faster veneer drying than sawn timber with less degrade.
- The use of logs unsuitable for sawmilling.
  - Generally shorter, smaller diameters logs.

## Peeling summary

The project has demonstrated that coconut palms can be rotary peeled using currently available spindle-less lathe technologies.

The project has identified:

- The recovered veneer has a wide range of qualities.
- To maximise its value:
  - Careful grading and segregation is needed to manage these.
  - Effective veneer grading systems need to be developed along the supply chain.



## Questions

