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 1 hour.
- 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
Initial experimental peeling trial in Fiji

- Lathe performed well
- 23 logs (1.5 m³) 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.

VTB commercial peeling trial
VTB commercial peeling trial

Advanced veneer and other product from coconut wood
VTB commercial peeling trial

Compact commercial peeling trial in Fiji

– 171 of 2500mm billets processed.
– About 15 m3 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.

Advanced veneer and other product from coconut wood
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.

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.
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.