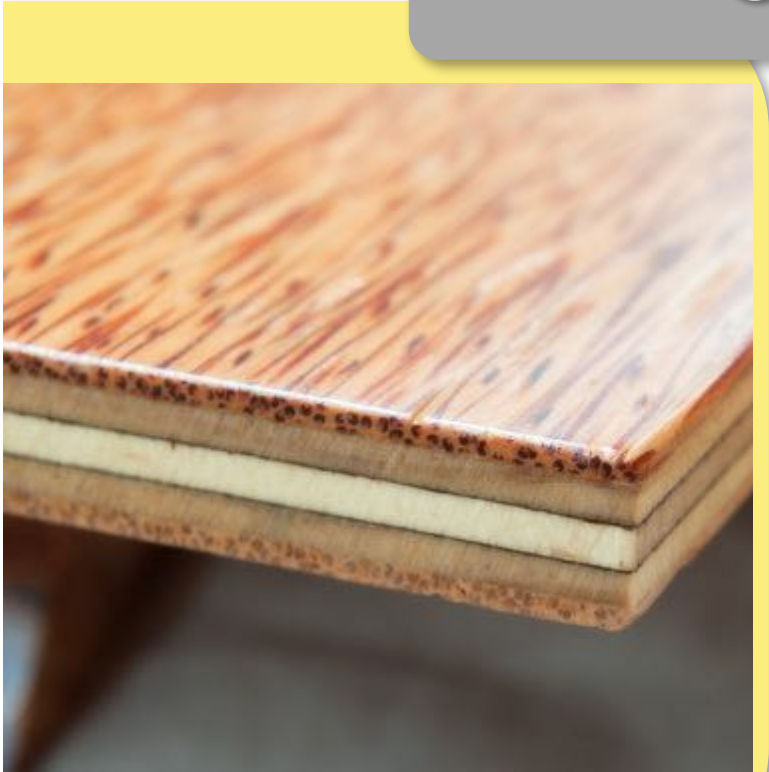


# Cocoveneer Products



## Characteristics of coconut veneer and veneer products

Dr Rob McGavin

Queensland Department of Agriculture & Fisheries

June 2016

# Veneer Qualities

## Knowledge and data collected from veneer assessments

- Colour
- **Roughness**
- **Splits**
- Brittleness
- **Collapse**
- Decay
- Compression
- Wane
- Insects, etc



# Veneer Qualities

Knowledge and data collected from veneer assessments

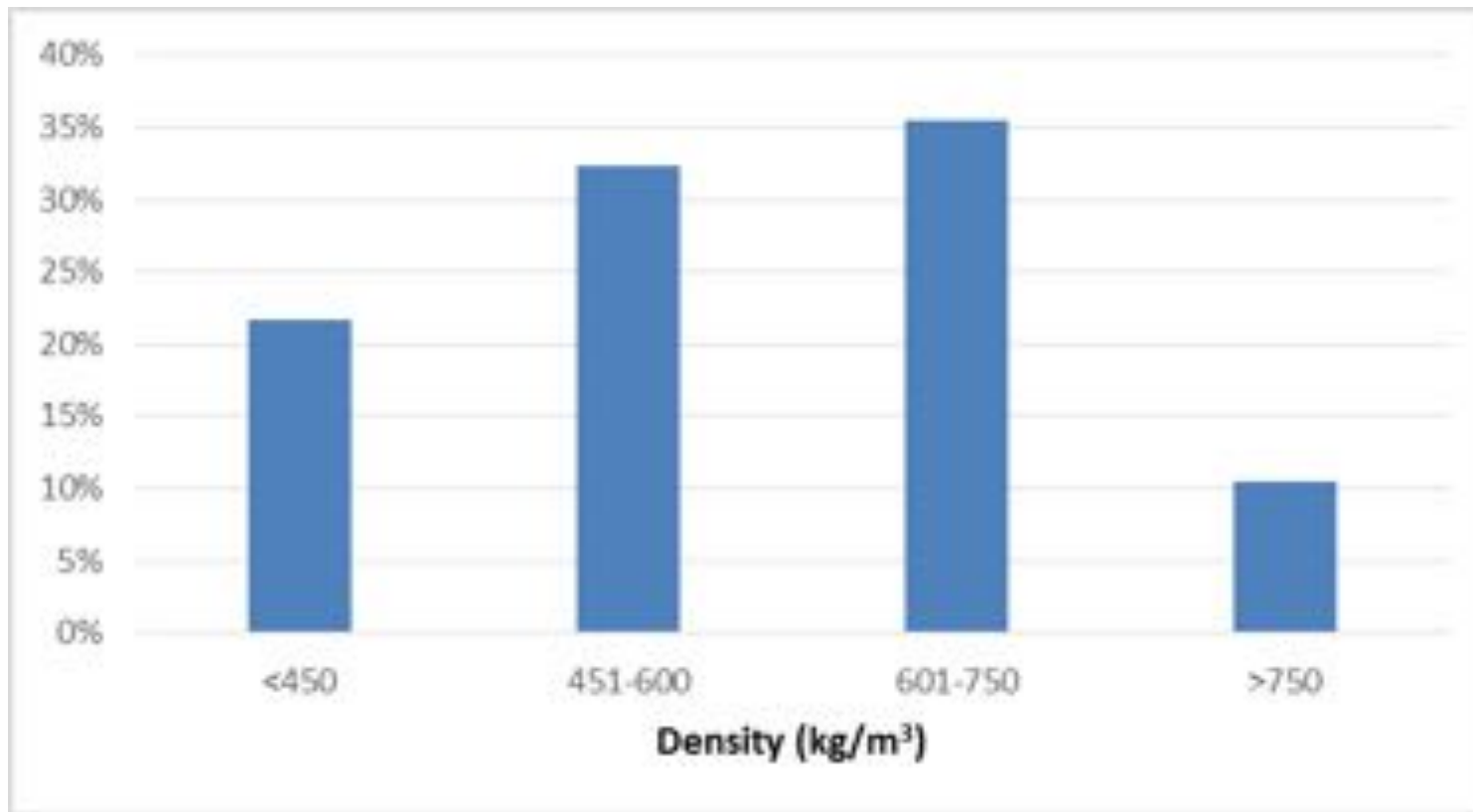
- Superior Quality – 15%
- High Quality – 50% (35%)
- Standard Grade – 84% (34%)



Advanced veneer and other product from coconut wood

# Veneer Qualities

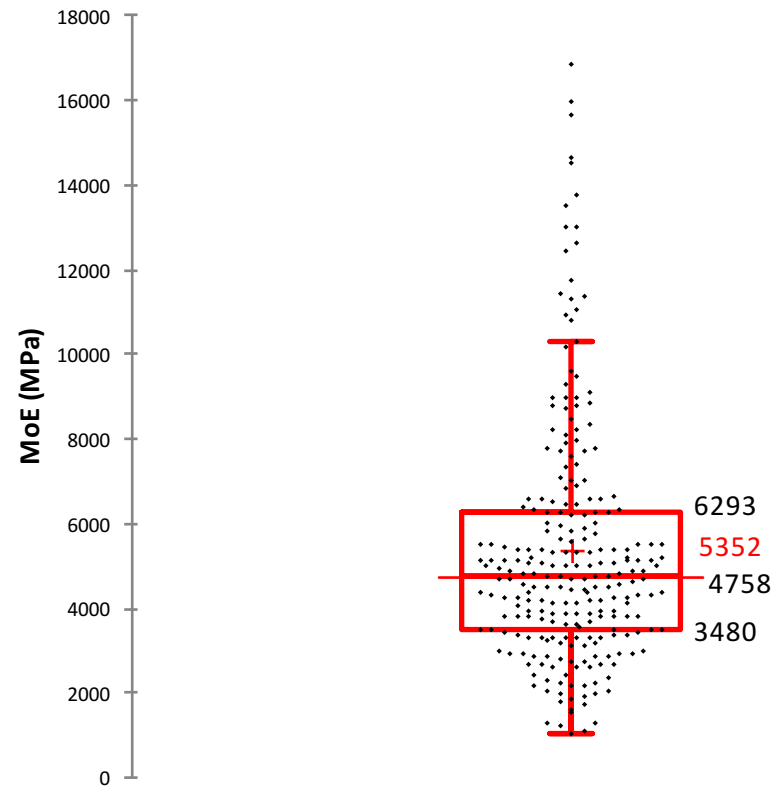
Knowledge and data collected from veneer assessments



Advanced veneer and other product from coconut wood

# Veneer Qualities

Knowledge and data collected from veneer assessments



# Product Options

## **Stage 1 - Architectural Products:**

- Plywood, appearance veneer overlaid on a substrate, engineered flooring, multi-laminar products

## **Stage 2 - Structural Products:**

- Plywood and laminated veneer lumber (LVL)

# Products

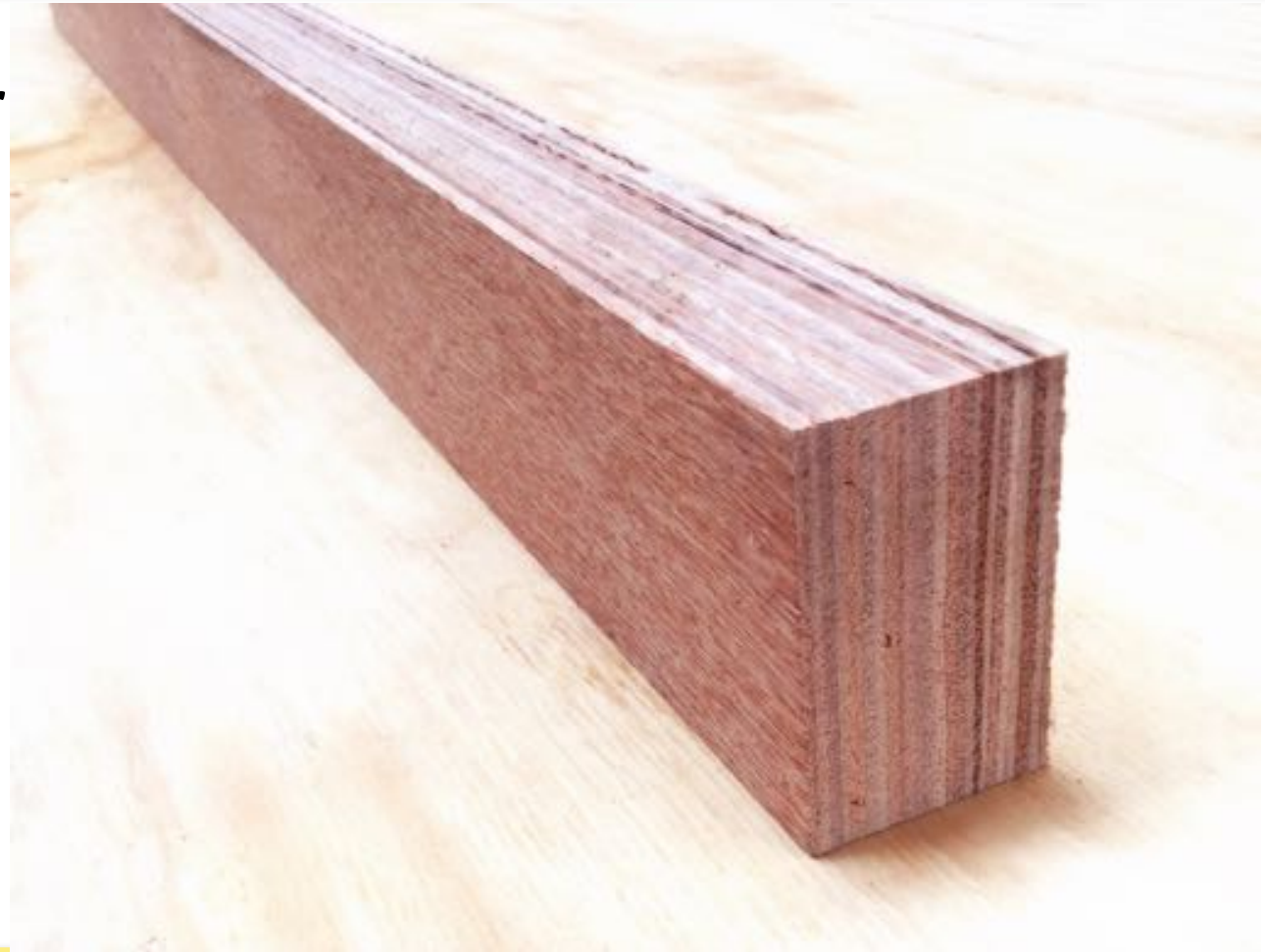
## *Plywood*



Advanced veneer and other product from coconut wood

# Products

## *Laminated veneer lumber*



Advanced veneer and other product from coconut wood



# Products

## *Overlay products*



Advanced veneer and other product from coconut wood

# Products

## *Engineered flooring*



Advanced veneer and other product from coconut wood

# Products

## ***Multilaminar***



Advanced veneer and other product from coconut wood

# Products

## *Multilaminar*



Advanced veneer and other product from coconut wood

# Products

## *Multilaminar*



Advanced veneer and other product from coconut wood

# Products

## *Multilaminar*



Advanced veneer and other product from coconut wood

# Products

## *Multilaminar*



Advanced veneer and other product from coconut wood

# Structural Products

## *Structural product manufacture and testing*

- Larger scale product manufacture
- Focus on construction strategies
- Manufacturing protocols
- Mechanical properties



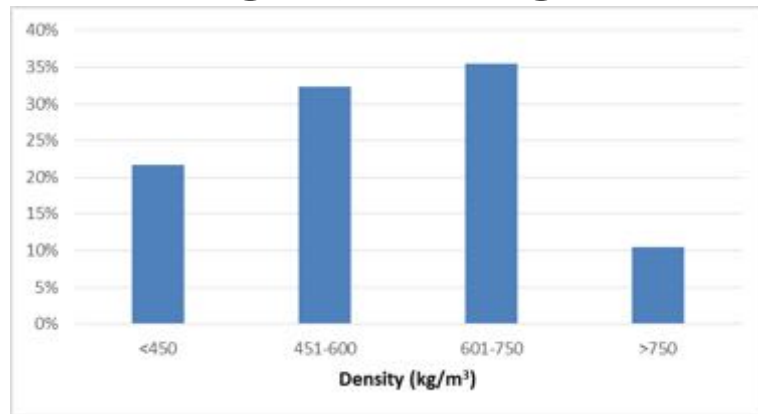
Advanced veneer and other product from coconut wood



# Structural Products

## 4 Density batches

- Low (<450kg/m<sup>3</sup>)
- Medium (450-600)
- Med-high (600-750)
- High (>750kg/m<sup>3</sup>)



Advanced veneer and other product from coconut wood

# Structural Products

## 4 Construction strategies

- A – low density
- B – medium density
- C – Med-high density
- D – High density faces with medium core

Face veneers - Visual grade 2

Core veneers – Visual grade 3



# Structural Products

## Manufacturing

- Conventional equip
- Standard adhesive systems with adjusted mix and manufacturing protocols



Advanced veneer and other product from coconut wood

# Structural Products

## Mechanical Properties

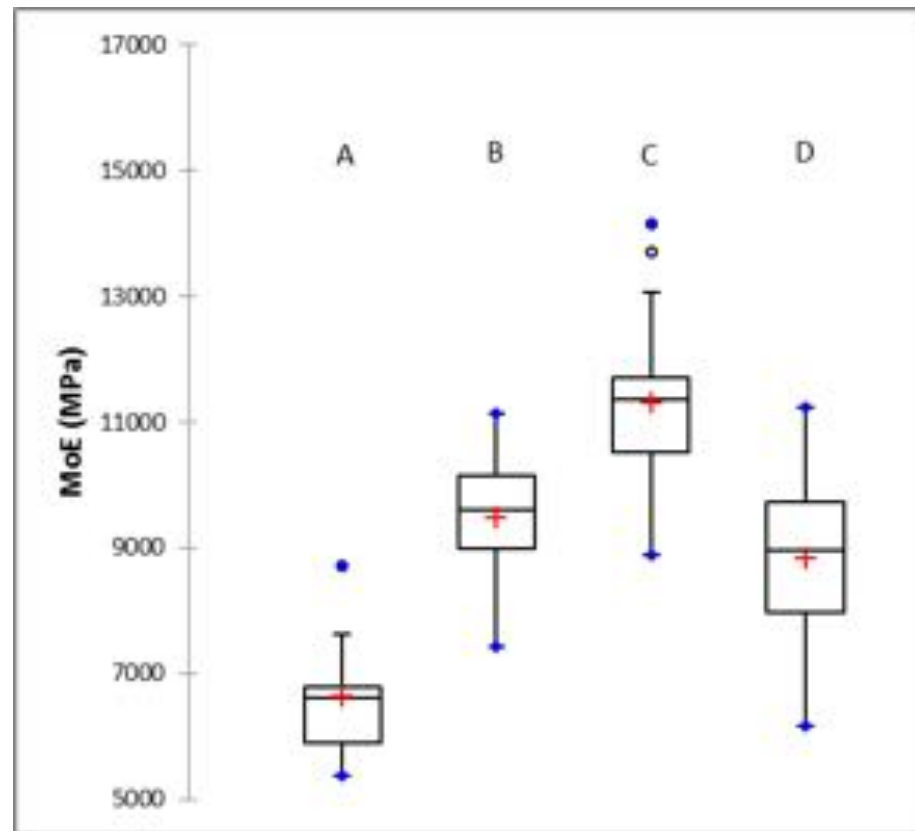
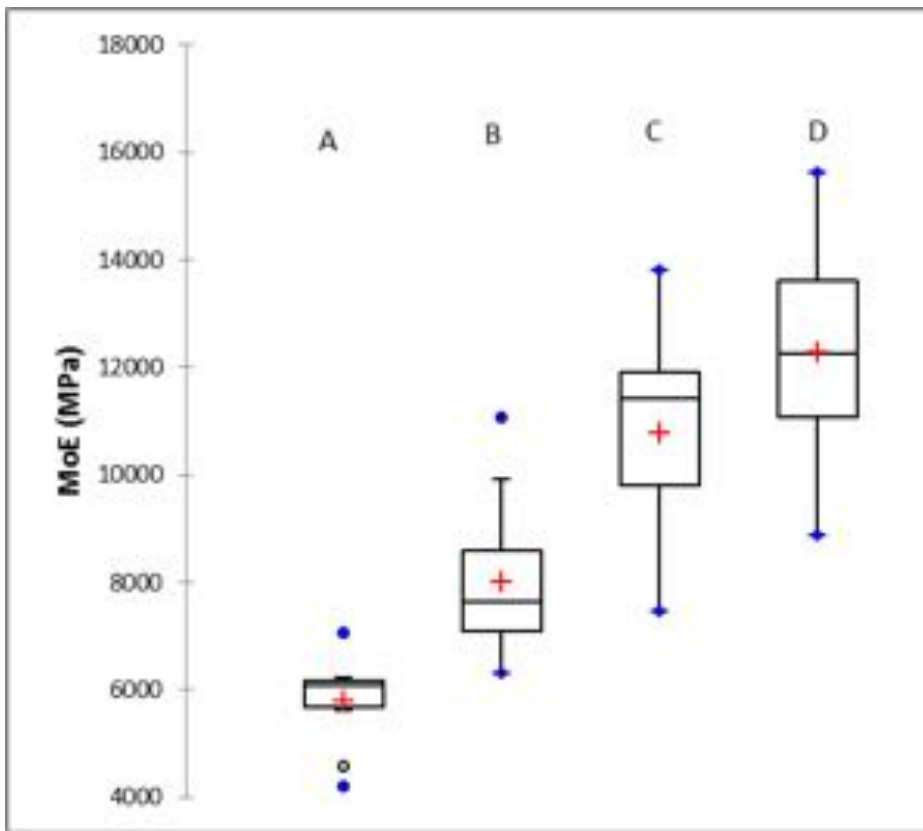
- Modulus of Elasticity
- Modulus of Rupture
- Panel Shear
- Hardness
- Bond Quality



Advanced veneer and other product from coconut wood

# Structural Products

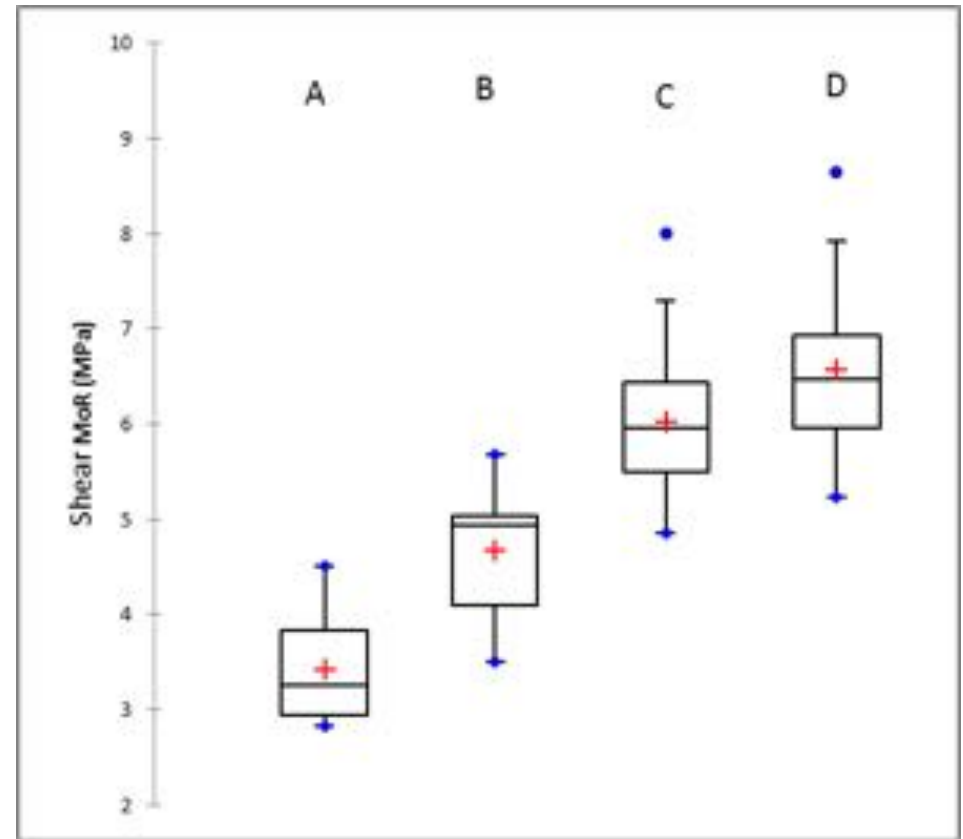
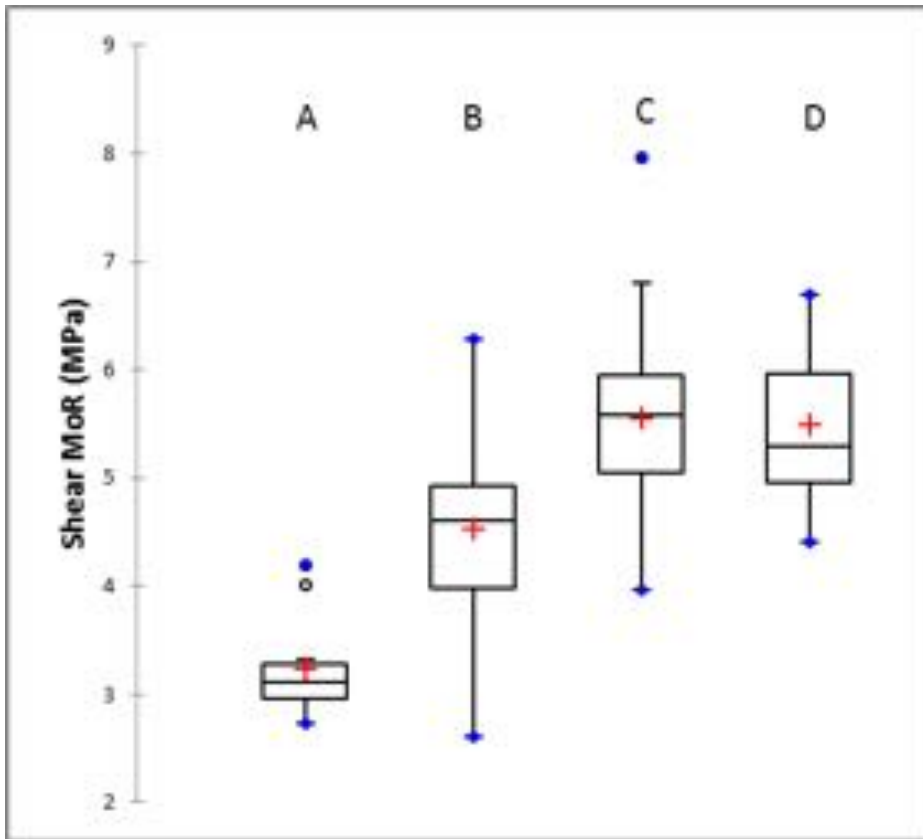
## Modulus of Elasticity (plywood)



Advanced veneer and other product from coconut wood

# Structural Products

## Panel Shear (plywood)



Advanced veneer and other product from coconut wood

# Structural Products

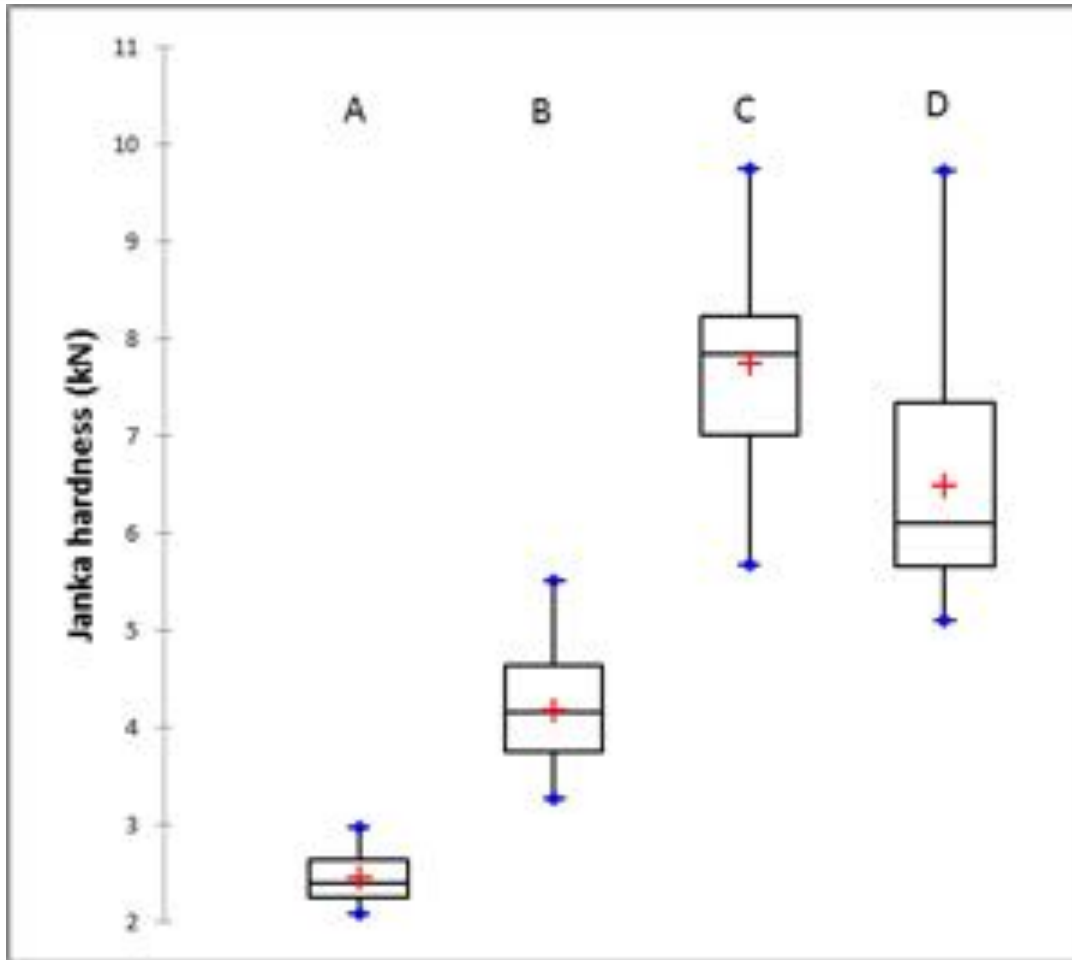
## Assigned F-grades (plywood)

Construction strategy	Bending MOE (E)		Bending MOR ( $f'_b$ )		Panel shear ( $f'_s$ )	
	Para	Perp	Para	Perp	Para	Perp
<b>A</b>	F4	F4	F8	F11	F4	F4
<b>B</b>	F5	F8	F11	F17	F4	F4
<b>C</b>	F11	F11	F11	F22	F5	F11
<b>D</b>	F11	F7	F14	F17	F8	F14

Advanced veneer and other product from coconut wood

# Structural Products

## Hardness (plywood)





# Structural Products

## Bond Quality (plywood)

- 93% passed rigorous A-bond criteria
- Failed bonds probably batch related



Advanced veneer and other product from coconut wood

# Product Summary

- A range of appearance and structural product opportunities exist for coconut veneer
- Coconut veneer has some unique qualities that enable potentially high value niche markets to be pursued
- Common adhesive systems can be adapted
- Construction strategies can make efficient use of variable qualities

# Questions



Australian Government  
Australian Centre for  
International Agricultural Research



Queensland  
Government

