



## R&D Works – February 2015

Welcome to our February edition of the R&D Works newsletter.

This month our stories include a productivity study into the effects of time-of-day impacts on machine operation in an off-forest processing yard; the use of an Australian wasp as a biocontrol in South Africa's commercial Eucalyptus plantations; a study on biophilic design (the affinity humans have for nature) which indicates that buildings with high levels of wood content have a positive physiological impact; an rapid non-destructive moisture meter for testing woodchips using magnetic resonance; and an FWPA funded project that assessed the comparative durability of African mahogany (Khaya senegalensis) in weather exposed above-ground applications.

There is also information about an eco-friendly process for increasing the fire resistance of timber that also improves strength and a European-based study summarizing research combining lidar and radar in the estimation of aboveground biomass.

I do hope you enjoy reading about these exciting research projects.

Ric Sinclair  
Managing Director  
FWPA

---

## MAIN NEWS

### Building with wood is healthier

Recent studies indicate that buildings with



a high level of wood content have a positive physiological impact on the human nervous system.

David Fell, research leader for market research at FPIInnovations in Canada, said that the use of wood indoors lowers stress reactivity of the sympathetic nervous system—which is associated with lower blood pressure, lower heart-rate, lower psychological stress, lower susceptibility to illness, and a better ability to focus attention.

[More..](#)

## Durability testing of African mahogany

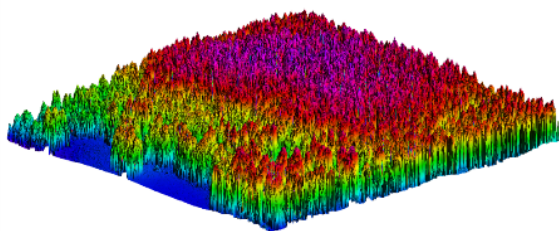


African mahogany (*Khaya senegalensis*) is being grown in Northern Territory plantations to produce timber for high value decorative panels, furniture, and flooring. In its home environment of west Africa, the timber is considered resistant to termites and borers, although until now that hasn't been fully tested for Australian conditions. As a consequence, FWPA is helping fund an important study through the Queensland Governments Department of Agriculture, Fisheries and Forestry that will expand the potential markets for this exciting plantation product.

[More..](#)

**PRB287-11112 - [See full report.](#)**

## Calculating forest biomass with lidar & radar



Research activities combining lidar and radar remote sensing have increased in recent years. The main focus in combining lidar-radar forest remote sensing has been on the retrieval of the aboveground biomass (AGB). AGB has been identified as a primary variable related to carbon cycle in land ecosystems.

[More..](#)

# FOREST GROWING

## Estimation of forest structure using RapidEye satellite data



Climate change is creating an increasingly dynamic forest structure and there is a need to collect data more frequently in order to maintain up-to-date information for forest management.

The Institute of Forest Management at the Technische Universität München has explored the use of RapidEye satellite data to provide more frequent updates to the information database. Forest structural information such as quadratic mean diameter, basal area, stem number and volume were estimated using multi-seasonal analysis of three RapidEye datasets.

[More..](#)

## Australian wasp to safeguard SA's commercial forests



One small Australian wasp is killing another tiny Australian wasp in South Africa's commercial forests – and it is a good thing. *Leptocybe invasa* was first spotted in Eucalyptus trees outside its native Australia in 2000 and has since has caused significant damage to plantations across the world.

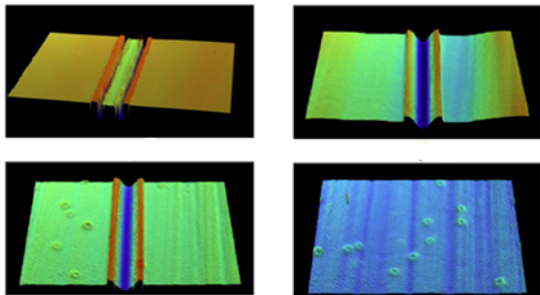
[More..](#)

# NEW PRODUCT INNOVATIONS

## Self-healing wood coatings

Scratch resistance is an important





attribute with regard to service life and aesthetics of coatings used on appearance wood products. In its quest for developing better performing coatings, FPInnovations recently examined self-healing coatings.

[More..](#)

## Mobile scanner game changer for forestry management

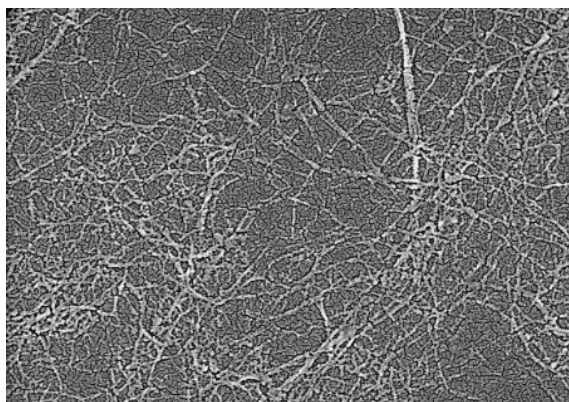


A small, lightweight mobile laser scanning device is proving a boon for forestry resource management.

Successful trials of the ZEB1 hand held scanner by Scion's Forest Systems staff has demonstrated the means to accurately locate and measure the lower stems of individual trees in more detail than is possible using aerial LiDAR (Light Detection and Radar).

[More..](#)

## New production technique could boost the use of nanocellulose



While we hear a lot about the wonders of materials like graphene and carbon nanotubes, nanofibrillated cellulose also shows a lot of promise. Nanofibrillated cellulose (Cellulose NanoFibrils, or CNF), typically made from wood waste, is fairly energy-intensive to produce as it takes considerable energy to rip the wood fibers apart. However, a new technique may soon change this.

[More..](#)

# MARKETS

## A sustainable flame retardant for timber buildings



Scientists have developed an eco-friendly process for increasing the fire resistance of timber that also dramatically increases its strength. While methods for fire-proofing timber materials already exist, most of them involve treatments that employ substances that are noxious or hazardous to human health.

[More..](#)

## TIMBER CONSTRUCTION AND DESIGN

### Engineers build & test earthquake-resistant house



Stanford engineers have built and tested an earthquake-resistant house that stayed staunchly upright even as it shook at three times the intensity of the destructive 1989 Loma Prieta temblor 25 years ago.

[More..](#)

## WOOD HARVESTING, TRANSPORT AND LOGISTICS

### Time of day impacting central processing yard productivity

Effective use of the high capital cost equipment in a central processing yard requires a good understanding of the human component of the system. The aim of this New Zealand study was to determine if time of day impacts machine productivity and value recovery in an off-forest central processing yard.

[More..](#)



## OTHER

### **An accurate and fast method for moisture content determination**



Moisture content is an important quality parameter of wood chips, strongly influencing the net calorific value as received, and consequently the price of fuel chips.

The oven-drying method is the current standard for determining moisture content, however the process can take too long give useful results. A fast and reliable method for determining moisture content would therefore be valuable.

[More..](#)

### **The use of smartphones as low-cost forestry hypsometers**

Various applications are currently available for Android that allows the estimation of tree heights by using the 3D accelerometer on smartphones. Some make the estimation using the image on the screen, while others point with the edges of the terminal.

[More..](#)



---

*Copyright © 2015 FWPA, All rights reserved.*  
You are receiving this email as you have registered to the FWPA Newsletter

**Our mailing address is:**

FWPA  
Level 4, 10-16 Queen Street  
Melbourne, Vic 3000  
Australia

[Add us to your address book](#)

[unsubscribe from this list](#)   [update subscription preferences](#)