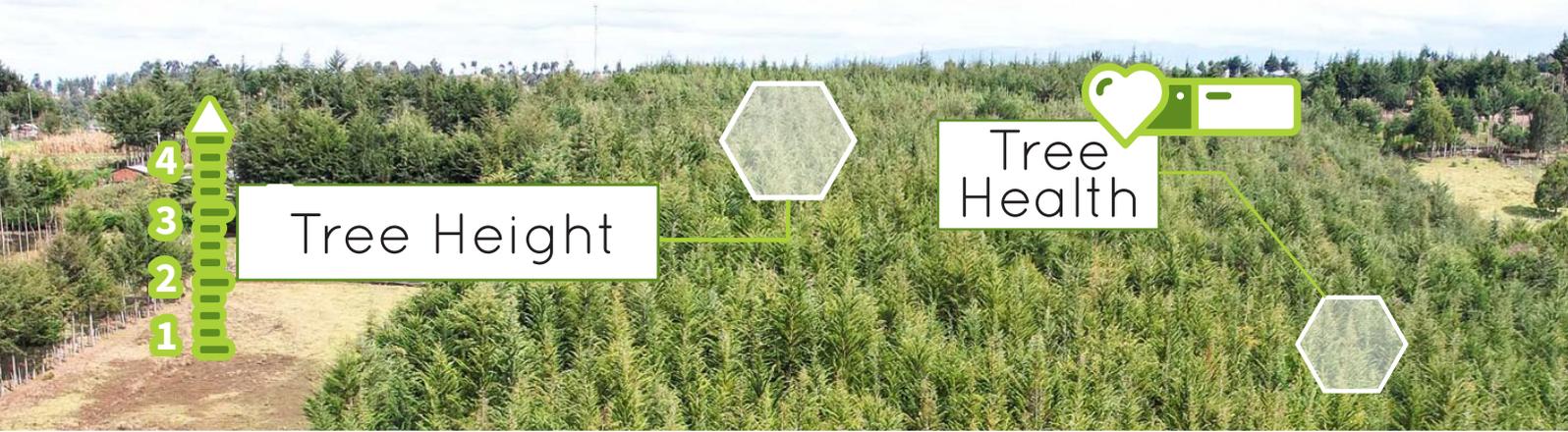
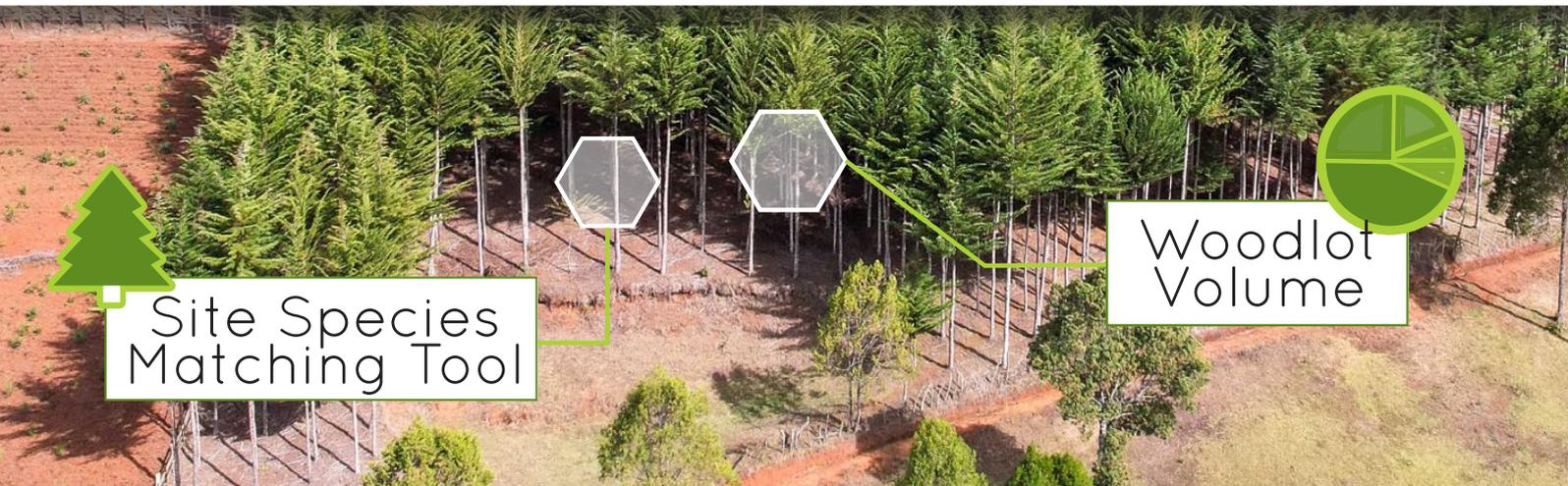




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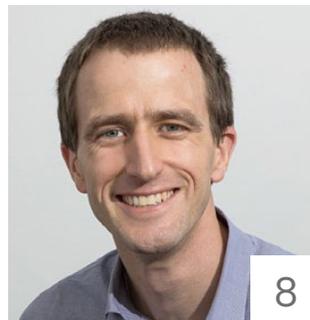
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Hybrid events are a must!

The countdown to year-end may be in its final weeks; however, South Africa's forestry, sawmilling and furniture industries are a-buzz with "business as usual".

There is an uptick in forestry, sawmilling and furniture-related meetings, with most organisers realising the value of broadening their impact by hosting hybrid events.

Combining in-person and virtual audiences is essential for fostering inclusiveness and transparency. The escalating costs of fuel, flights, accommodation and meals and tight cash flow make it difficult for small business owners or key employees to attend an out-of-town event.

While I agree that nothing beats the networking and psycho-social experiences of attending a "live" conference, the opportunity to participate or observe virtually is also a powerful enabler.

Kudos to Sawmilling SA (SSA), the SA Furniture Initiative (SAFI), the Timber Industry Pesticides Working Group (TIPWG), Forestry SA (FSA) and Forsilvitech for providing web-based access to their activities.

This issue of the magazine features a multitude of meetings. We begin with news from the furniture industry. SAFI's annual general meeting was a hybrid meeting followed by its thought-provoking annual Furniture Forum. The forum focused on the proactive work by SAFI's board and working groups that are actioning the Furniture Industry Master Plan while it waits for final state approval.

Fire was the smouldering topic of the fourth edition of the SSA and partners' Talking Timber webinar series. A virtual audience of nearly 100 people learnt about fire and designing timber buildings for fire safety. Still on sawmilling, read about Peter Allan Timber and its new Vacsol Azure treatment plant in Cape Town.

The cover story features a small Pretoria-based company making its mark in East Africa. Swift Geospatial's GIS-based forestry platform provides timely and relevant information for decision-making. It set the scene for NMU's Forsilvitech webinar unpacking some modern technologies improving and refining silviculture practices. An international audience of over 300 attended the webinar.

Science-based decision-making is essential, especially when dealing with government and certification bodies. Please read about the depth of work delivered by TIPWG and the value our scientists add to the forestry sector.

Finally, Stellenbosch University's symposium on climate-smart forestry examined the mitigation and/or adaptation approaches to climate change. Several speakers believe the primary solution is a punitive carbon tax.



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'Together is better' says the SA furniture industry

Over the last four years, the changing relationship between South Africa's furniture manufacturers, retailers, raw material suppliers and the government is transforming furniture manufacturing from a sunset industry to one focused on quality standards, market development, consumer education, and collaboration.

By Joy Crane

The catalysts for the industry's revival are the South African Furniture Initiative (SAFI) and the Furniture Industry Master Plan (FIMP).

Previous attempts to unite the furniture industry were short-lived largely because of bickering, distrust of the bargaining council, lethargy and poor communication. The launch of SAFI was met with some scepticism; however, the organisation has weathered five years and support from industry stakeholders is growing.

Work on the FIMP began in 2018, and the final iteration is delayed by red tape. Despite the drawn-out process, SAFI, the Department of Trade Industry and Competition (the dtic) and various state institutions are ensuring progress.

FURNITURE SECTOR FORUM

Each year SAFI organises a Furniture Sector Forum to discuss the industry outlook and solutions to challenges it faces. This year the theme of the fourth forum was "Cohesion: Together is Better".

The meeting was facilitated by Jeannine van Straaten of Proudly South African, and the speakers were:

- Ongama Mtimka, political, economic and business commentator
- Penwell Lunga, chairperson of the SAFI board
- Tafadzwa Nyanzunda, director of resource-based industries at the dtic
- Greg Boule, consultant at the Industrial Development Corporation (IDC)
- John Rocha, chief director: Trade Invest Africa at the dtic

- Nicole Moonsamy: business development manager at the IDC
- Mark Goliath, head: textiles and wood products at the IDC

SAFI

Lunga kicked off the forum by emphasising that SAFI is a cohesive platform. Stakeholders work together to create market access opportunities to grow the industry, align relevant policies, drive competitive manufacturing, and support sustainable raw material supply.

"Our purpose is to build a globally competitive and transformed furniture industry that shapes lives in every home, school and workplace in Africa and beyond," he said.

"Our four strategic priorities are to facilitate market access for locally manufactured furniture, curb illegal imports of furniture products, data collection and develop market intelligence, and improve the technical and design capacity of the industry.

"SAFI cannot guarantee a sustainable, globally competitive and transformed industry. However, together SAFI's members can. Are we going to allow the environment to shape us, or are we going to shape it?"

"We need everyone to get involved to achieve our goal of becoming globally competitive. Together is better," Lunga concluded.

THE DTIC

Tafadzwa Nyanzunda said the furniture industry, government and labour are working well together as social partners united around the common growth goal. "We have witnessed the success stories of the



Tafadzwa Nyanzunda of the dtic,



Penwell Lunga.

automotive and clothing master plans, and the dtic is convinced the FIMP will achieve its objectives," she said.

"The master plan was presented to the dtic Parliamentary Portfolio Committee on 28 September. On 30 September, a progress report was presented to the Public Private Growth Initiative (PPGI) chaired by the presidency. It is ready for sign-off by all parties," she reported. The FIMP plans to build local supply capacity and demand, competitiveness, export promotion, improved raw materials and the skills available to the industry.

"The master plan is a living document and must keep evolving. We need commitment from stakeholders to work together to implement it."

FUNDING, INCENTIVES AND TRADE

Greg Boule described the rationale, criteria, fund structure and application process of the IDC's Furniture Industry Challenge Fund. "The graph (Fig 1) shows growth in furniture production volumes until 2008, when the global financial crisis hit. There has been a steady decline since 2014, when the National Credit Act was passed. Additional impacts include the failure of Ellerines and its stores and the lockdown," Boule said. "The employment graph (Fig 2) mirrors the index of production. At its peak in 2002, the industry employed 58,563 people, and by 2020 only 28,743 people had jobs."

The fund assists qualifying furniture manufacturers in improving their competitiveness, increasing the localisation of production within the value chain, promoting economic inclusion and maintaining and increasing current employment.

Nicole Moonsamy of the IDC said the clothing and textiles industry, like the furniture industry, lost half of its employment opportunities. This prompted the Retail-clothing, Textile, Footwear and Leather Master Plan.

The IDC's strategic business unit for textiles and wood supports various enterprises across both sectors. The aim is to build a locally and regionally competitive industry through strategic partnerships that promote entrepreneurship and social and industrial development.

John Rocha, chief director of Trade Invest Africa, spoke about the intricacies of doing business in Africa. He gave an update on the African Continental Free Trade Area (AfCFTA) and explained the services offered by the dtic.

He said South Africa is the major player in intra-African trade, with a share of exports varying from 26% to 31% over the period 2013-2019, followed by Nigeria (13,9% in 2019) and DRC (7% in 2019). The country is also the leading player in intra-African

Furniture
Index of Physical Volume Production
Actual indices - Index 2019 = 100 SIC MP139100
Source: StatsSA

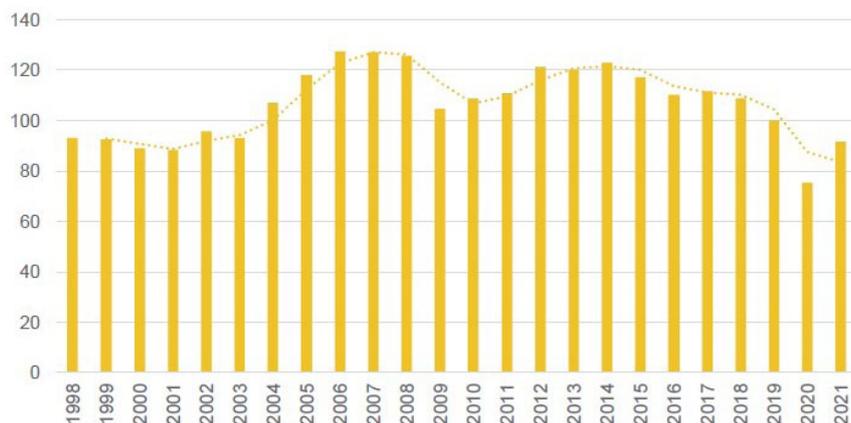


Fig 1. Furniture production grew to 2008 and is steadily declining.

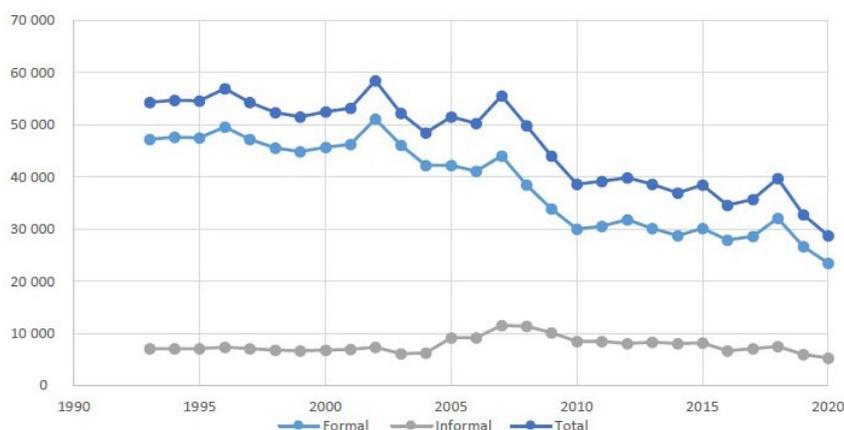


Fig 2. Employment in the furniture industry 1993 - 2020 reflects the production stats. Source FIMP adapted from Quantec data.

imports (14%), followed by Namibia (7%) and Botswana (6%).

Exports into the rest of Africa grew from about R9 billion rand in 1994 to over R386 billion by 2021. Trade with the Rest of Africa sustains about 250,000 jobs locally and contributes about R60 billion towards our economic output.

Rocha said the overall aim is to help frame a viable market entry strategy to increase exports of SA furniture into the rest of Africa and to capitalise on the opportunities flowing from the implementation of the AfCFTA. Trade Invest Africa wants to build a solid, well-coordinated and focused public-private partnership team to originate and close deals.

PANEL DISCUSSION

The last forum session was a panel discussion with clothing and textile sector members. They shared their experiences drawing up and implementing the Retail-clothing, Textile, Footwear and Leather Master Plan. 🌱



Nicole Moonsamy.



Greg Boule.

SAFI 2022/3 Board members

The 2022/23 South African Furniture Initiative (SAFI) board members were elected at the organisation's AGM in October.



Ten of the 18 members of the 22-2023 SAFI Board.

The board members are Penwell Lunga (chairperson), Bernadette Isaacs (MD), Educated Nkosi, Greg Boule, Johann Claassen, Jonathan van Rooyen, Justin Berry, Max Frehse, Michael Borchers, Mohammed Hansa, Morné Smith, Nico Badenhorst, Peter Grey, Shumaiz Acharath-Parakatt Mahal, Stephan Nieuwoudt, Stephanie Forbes, Victor Abrahams and Walter Dyers. Ten of the 18 board members are in the picture supplied by SAFI.

SAFI works with furniture industry stakeholders to create market access opportunities to grow the industry, align relevant policies, drive competitive manufacturing and support sustainable raw material supply.

In his chairperson's message in SAFI's 2022 Annual Report Penwell Lunga says SAFI played a pivotal role in proposing a five-phase approach on imports to the SA Revenue Services (SARS) prevent illegal and poor-quality furniture imports.

The phases are tariff clarification, quality standards development, enforcement, monitoring and giving the customer the choice.

Lunga said an application to amend the furniture tariff headings was made, SANS 1528-2 and SANS 1528-3 were submitted and approved, and a training programme for customs officials on the content of upholstered furniture is ready for delivery.

Monitoring is ongoing, and the industry works with relevant

stakeholders on labelling and identifying the origin of imported furniture products to determine what is locally made and the local raw material content in collaboration with Proudly South African.

Raw materials at risk were identified and a successful action plan to stop the shortage of wood-based boards was implemented. SAFI also negotiated the temporary steel rebate granted on 15 July, while.

Lunga said the curriculum for the new upholstery trade qualification is approved and the next step is developing learning materials. The furniture design and furniture maker qualifications are waiting for approval by the Quality Council for Trades & Occupations (QCTO). 🌱

Master plan lessons from the clothing and textiles sector

The recently held Furniture Sector Forum included a panel discussion between a trade union leader, a manufacturer and a retail representative of the clothing and textile industries. They shared some of the challenges they experienced during the early implementation stages of the Retail-clothing, Textile, Footwear and Leather Master Plan (RTFLM)

By Joy Crane



Etienne Vlok.

In a frank discussion, Etienne Vlok, the national industrial policy officer of the SA Clothing and Textiles Workers Union (Sactwu), said the union initially opposed a master plan led by retailers.

"Retailers in the clothing industry are powerful. In the 2000s, the tension between labour and retailers grew because we felt they were contributing to the closure of factories by flooding the market with cheap imports," says Vlok.

"The union formed a customised sector programme excluding the retailers. The programme failed, and we realised we had to find ways to work with retailers. It wasn't easy opening communication channels in an adverse business environment. Today we are partners in implementing the master plan," he comments.



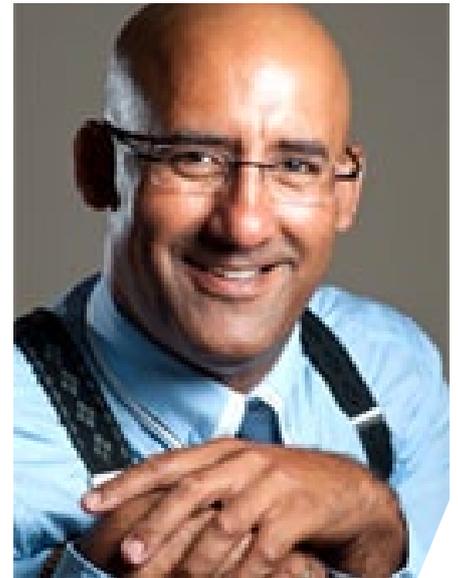
Mark Goliath.

Imraan Bux, the owner of a textile mill in KwaZulu-Natal, says manufacturers would like retailers to buy the products they make.

"But it doesn't work that way. Retailers are consumer and brand driven. They want us to supply what they need for their market segments. Manufacturers must try to understand the markets and accept the role of retail," advises Bux.

Michael Lawrence, the national director of the Clothing Retail Association, says the association's members and non-members are co-funding the master plan. They realise its value.

"Substantial investments from retailers are going into local manufacturing. SARS says less than 40% of the product is locally made. Still, the master plan community calculate that 45% of clothing



Michael Lawrence.

and textiles are locally made," he says. Lawrence explains that retail is looking beyond South Africa's borders for distribution systems that will create more demand and jobs. "The initial focus is Southern Africa and then further north. We see an immense opportunity for commercial expansion, which will be a win for the country."

INVESTING IN TECHNOLOGY

Vlok believes the lack of trust of retailers filtered through to the manufacturers. "Retailers want shorter lead times with more style changes. Labour is concerned that an over-reliance on investments in technology by manufacturers will result in job losses. But Sactwu is pragmatic and considers the immediate, medium and long-term opportunities. "We realised that automation does not

“A critical success factor for a master plan is the willingness to talk to each other”

– Etienne Vlok

mean losing members or workers. Instead, the industry is replacing imported textiles and clothes with machines, which creates more jobs,” explains Vlok.

Bux, who worked his way up from the shopfloor, says his textile mill can only compete by increasing efficiencies and flexibility and reducing lead times by adding automated machines.

“Unexpectedly, by doing this, demand for our products increased. Investment in new plant and equipment increased production by about one million metres of fabric and was paid off in six months. In our experience investing in technology

drives output, increases demand and creates jobs”.

THE POWER OF SOCIAL DIALOGUE

Bux says it is crucial for manufacturers to see the big picture and have a long-term strategy. “You need to recognise everyone’s roles and points of view and collaborate to implement the common objectives of the master plan.”

Vlok agrees. “The system works because all parties recognise the power of social dialogue. A critical success factor for a master plan is the willingness to talk to each other.

Lawrence says the success of a master plan is about the “spirit of the agreement. “The big win is finding a communication method that bypasses ideology. There will always be a difference in the way we approach each other. We must get past the fog and embrace each other’s values.

“It has been a challenging journey that made us look seriously at ourselves. We all knew we had to make it work.”

ENABLING COLLABORATION

Mark Goliath, head of the IDC’s clothing and textile division, says the organisation’s role is to be an enabler.

“Although we thought we knew the clothing and textiles value chain, we weren’t ready for the RTFLM. We were involved because we knew funding would be needed to capacitate the industry. But we weren’t prepared. It is now on track, and we are applying the lessons learnt to the Forestry Industry Master Plan (FIMP) 🌳

“In our experience investing in technology drives output, increases demand and creates jobs” – Imraan Bux

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TALKING TIMBER WEBINAR 4

Timber engineering for fire

Sawmilling South Africa's (SSA's) *Talking Timber* webinar series aims to overcome misconceptions about wood as a structural material by informing architects, engineers, insurance companies, regulatory authorities, academics, and developers about engineered timber products and innovative mass timber building systems.

By Joy Crane

Climate change mitigation is fuelling the global move by architects and structural engineers favouring timber over conventional building materials. However, the controversial issue of the safety of timber structures is always top of mind.

Timber and Fire was the hot topic of the fourth webinar in the Talking Timber events. Over 95 people attended the online sponsored by SSA, the Institute for Timber Construction SA (ITC-SA) and the SA Wood Preservers Association (Sawpa).

In her closing remarks, Tafadzwa Nyanzunda of the Department of Trade, Industry and Competition (the dtic) said the webinars form part of the Forestry Sector Master Plan strategy of promoting the use of timber in construction.

Prof Brand Wessels facilitated the discussion between Prof Richard Walls, head of the Fire Engineering Institute at the University of Stellenbosch, and Dirk Streicher, the founder of Ignis Testing Centre.

The Fire Engineering Institute is Africa's only fire engineering and structural design research institute. At the same time, the Ignis Testing Centre is Africa's only fire testing centre.

Walls and Streicher said fire safety engineering design is the starting point when designing timber buildings. "It is not an add-on at the end," they emphasised.

Walls warned that many structural engineers don't realise that when they

sign off a building under the Code of Practice for Designing Buildings, SANS 10160-1, the "accidental design situation" clause includes material failure and exposure to fire.

The presenters discussed the fire rating of materials and how they are derived. Streicher has conducted over 225 tests on various materials, including doors and panels, to see whether they have a sufficient fire rating and satisfy the time given for evacuating a burning area.

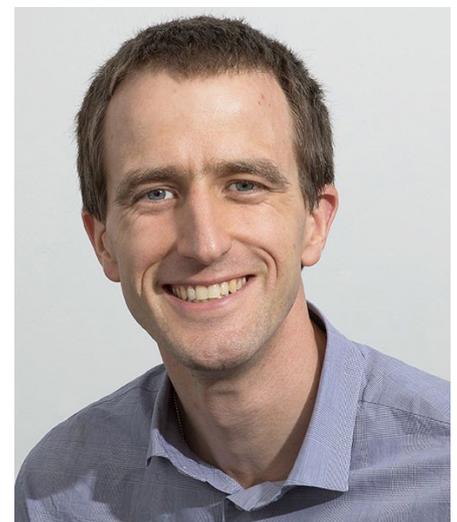
MATERIALS

Construction materials provide different protection during a fire:

- Steelwork provides passive protection. For example, intumescent paint on steel swells and presents a char layer. It protects the steel, and the extra time is measured to give a fire rating. However, sometimes the paint can cost more than the steel at higher fire ratings, such as 120min.
- Concrete expands and can fail. New, high-performance concretes are less fire resistant.
- Timber provides passive and sacrificial cover.

The failure of a material is measured against three elements known as REI:

- Resistance. The stability, strength, and structural resistance of the material. In other words, the load-carrying capacity and deflection
- Integrity: The passage of smoke and flame through the material must be prevented



Prof Richard Walls heads the fire engineering research institute at Stellenbosch University.



Dirk Streicher is the owner and founder of Ignis Testing.

- Insulation. How much heat passes through the material? The average temperature rise of the

upper surface (unexposed side) may not exceed 140°C, and the peak temperature rise may not exceed 180°C.

WHAT MAKES MASS TIMBER SAFE?

"The fire chief in a South African city will have a heart attack if you apply to build a 10-storey wood building. But mass timber is very popular in the northern hemisphere, Australia, and New Zealand. Stringent fire-safety engineering is applied when designing multi-storey timber buildings, some over 18 floors high, said Walls.

Mass timber elements are designed so that a sufficient cross-section of wood remains to sustain the design loads for the required duration of fire exposure.

"Mass timber is a unique building material. It achieves structural performance and passive fire-resistance objectives for larger and taller wood buildings while offering enhanced aesthetic value and

environmental responsibility," he said.

When timber is exposed to flames, it dehydrates, starts flaming (pyrolysis), and forms a char layer. The char layer acts as an insulator and protects the core of the wood section.

"We rely on char oxidation to protect our structures. Structural engineers must design for charring and what is known as the 'worst short-lived event in 50 years'. You need to know how fast the charred front moves to determine the fire rating of a timber species," Walls explained.

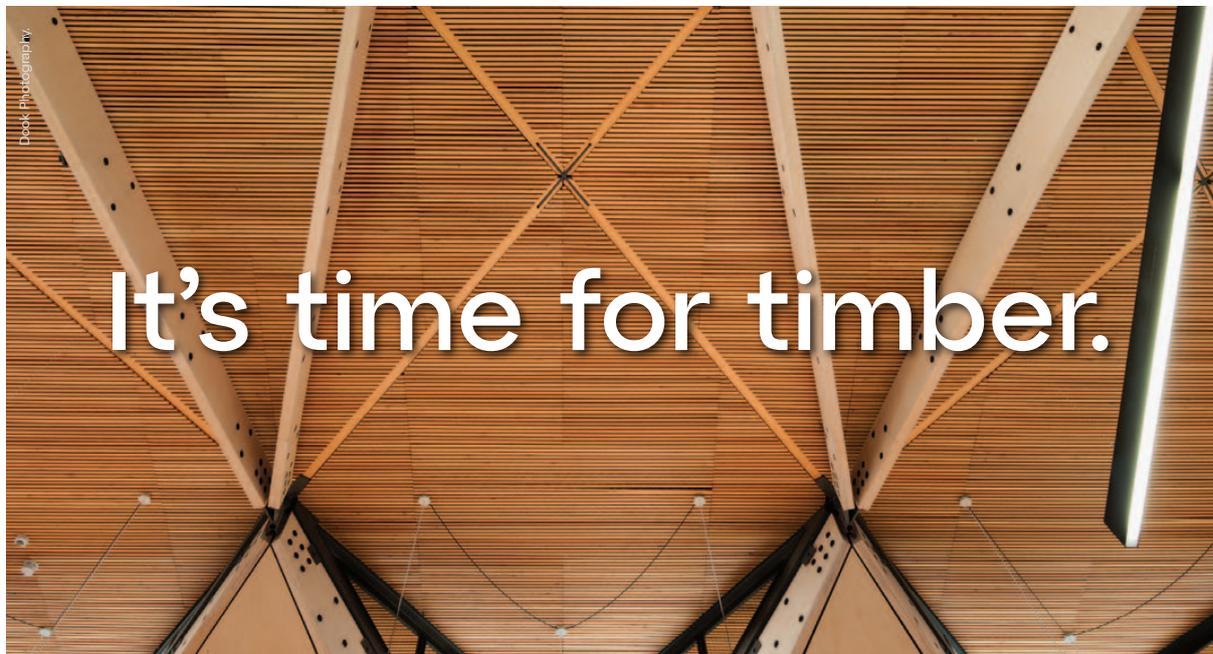
In a standard building, a 60min fire rating is based on the fuel load. But all the elements contribute to the fuel load when it is a timber building. The heat release rate and fire intensity increase with exposed timber. Some international building codes limit exposed wood areas and require that a percentage of beams be clad to reduce the heat release rate. There are two factors

to consider when designing with cross-laminated or mass timber: the adhesive and the connectors. Wessels said some tested adhesives like melamine urea-formaldehyde (MUF) perform better than polyurethane (PUR). It is the subject of ongoing post-graduate research.

A roof structure without metal connectors provides about one-hour resistance. Still, when plates or gang nails melt, you lose all structure integrity in five minutes. We need to do a lot of research into gang plates and the best way to connect timber members.

"Think about it," remarked Walls. "You can design the timber to work, but the real danger lies in the steel connectors that melt at high temperatures. Buildings collapse because the steel connectors are always the first thing that fails. Hence the use of intumescent coatings that protect them."

Streicher pointed out that intumescent coatings can be applied



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Partially charred glulam column on the left pre 2-hour fire test, and after on the right. Photo by David Barber of ARUP.

“Fire safety engineering is the starting point when designing timber buildings”

to timber, but they have not been tested enough. “It takes time to activate. If it stays bonded, it will provide additional protection. Still, the chemistry of the burning timber may influence the intumescence,” he said.

“The data pool we currently have is small, and more would be very helpful for professionals working in the timber industry,” Walls commented.

“Fire is one of the biggest challenges we face for large-scale adoption of mass timber in the South African built environment. We must not stop searching. We need more testing and thinking about timber and fire in structures,” the presenters concluded. 🌲



Example of char fall-off. Photo Daniel Brandon published in Fire Safe Use of Wood.

Guide on using fire-safe wood in structural applications published

The recently published *Fire Safe Use of Wood in Buildings Global Design Guide*, edited by Andrew Buchanan and Birgit Ostman, CRC Press, is the first international guideline for designing timber structures according to fire safety principles.

The Fire-Safe Use of Wood global network developed the guide. It comprises leading fire and timber researchers from

Australia, Canada, China, the Czech Republic, Estonia, Finland, Germany, Japan, New Zealand, Switzerland, Sweden, Russia, the United Kingdom and the USA.

The content includes fire behaviour, connections, firefighter considerations, fire spread, and structural design, among other aspects.

It describes the behaviour of fires in timber buildings and strategies for providing safety if unwanted fires occur. It guides building design to prevent fires from spreading while maintaining the load-bearing capacity of structural timber elements, connections and compartmentation. It also explores different regulation requirements from countries around the world.

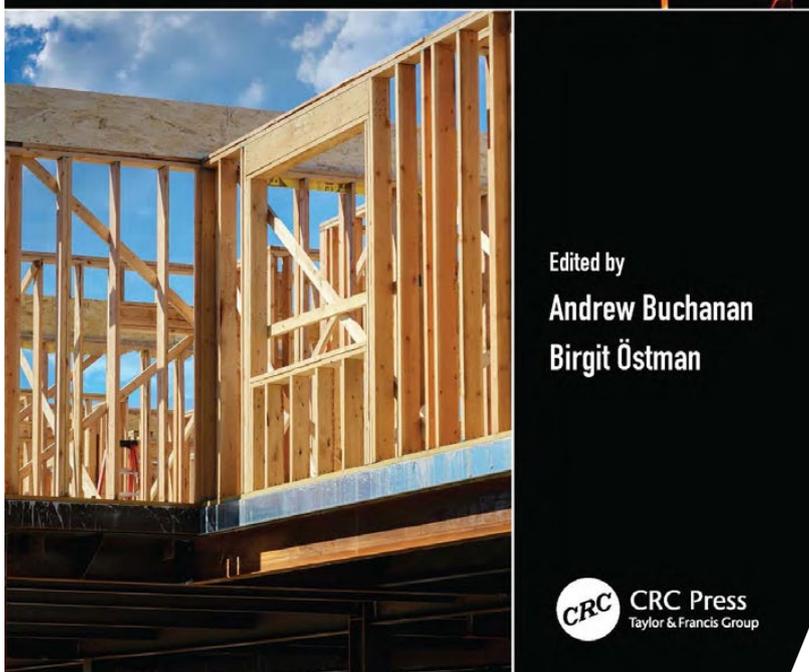
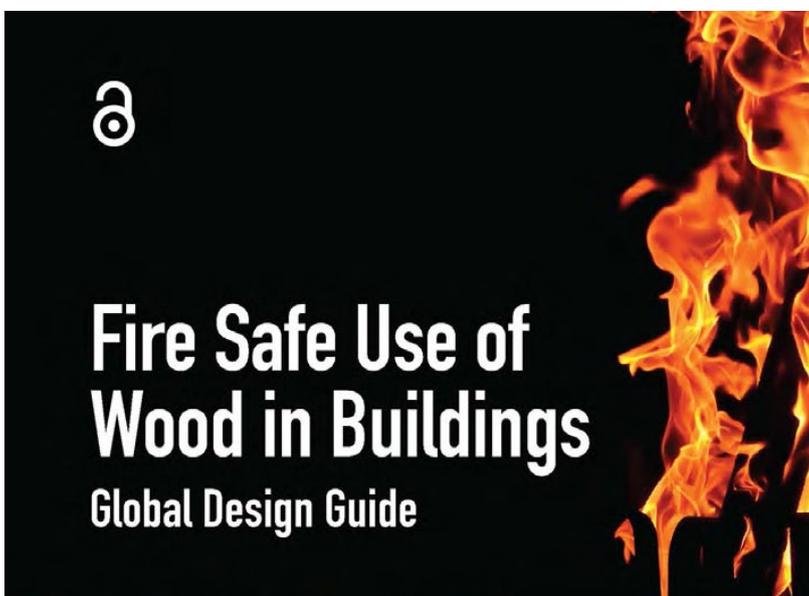
Prof Richard Walls of Stellenbosch University's Fire Engineering Institute says the 486 pages of "light bed-time reading" is currently the most advanced guideline on timber and fire.

The guide is edited by Andrew Buchanan, emeritus professor of Canterbury University, PTL Structural Consultants, New Zealand and Dr Birgit Östman, senior advisor to Linnaeus University, Sweden.

It has the following chapters:

1. Timber structures and wood products
2. Fire safety in timber buildings
3. Fire dynamics
4. Fire safety requirements in different regions
5. Reaction to fire performance
6. Fire-separating assemblies
7. Load-bearing timber structures
8. Timber connections
9. Prevention of fire spread within structures
10. Active fire protection by sprinklers
11. Performance-based design and risk assessment
12. Robustness in fire
13. Building execution and control
14. Firefighting considerations for timber buildings

You can download the open-access book from the *Fire-Safe Use of Wood* website. 



Peter Allan Timber invests in a Vacsol Azure treatment plant

After focusing on CCA (copper chrome arsenate) treatment for structural and landscape timber over the past 18 years, Peter Allan Timber has extended its business into the residential and commercial timber markets by installing a Vacsol Azure treatment plant in the Western Cape.

Wanting to offer a certified “green” and clear liquid preservation solution that maintains wood’s natural colour prompted the company management to turn to Arxada, a leading global wood treatment technologies supplier

CUSTOMER-CENTRIC

Known and trusted for their hands-on customer-centric approach, Arxada was available to offer a complete project management service from start to finish.

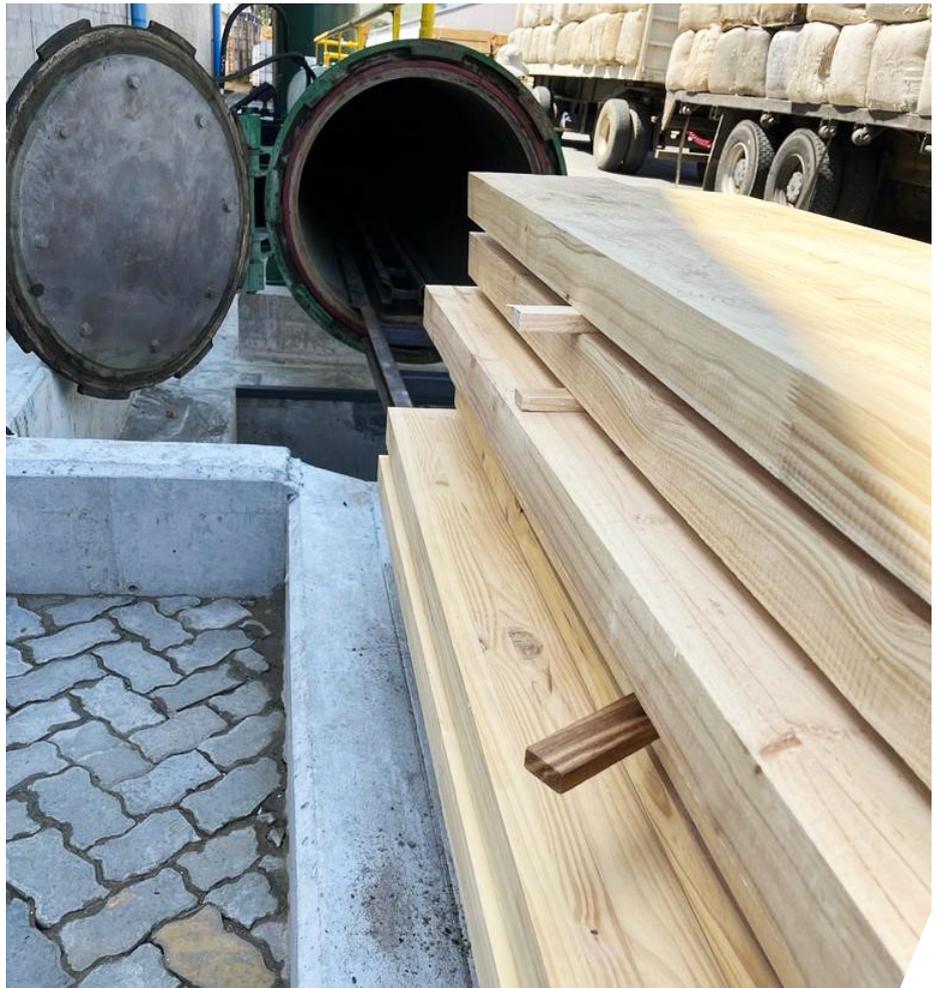
Arxada’s engineering co-ordinator, Robert Fourie, and customer account manager, Absolom Mngomezulu, guided the plant contractor in the manufacturing process and assisted with the sourcing and refurbishing of the new treatment plant.

Working as a team with Peter Allan Timber, they helped with the civil design, made recommendations on improving the plant process and advised on the engineering standards required for a Vacsol Azure treatment plant.

Arxada remained on site throughout the installation and commissioning to ensure the system operated optimally and troubleshoot if necessary. During this time, the plant operator received training on how to manage consumption, performance and efficiency.

ADDING VALUE

Jurie van Graan, a joint owner of Peter Allan Timber (formerly Thesen), chose to work with Arxada because of previous experience and confidence in their products and service provision.



Products lining up for treatment at the Vacsol Azure plant.

“Our relationship with Arxada, then trading as Koppers Arch, goes back to 2003 when we installed our CCA plant,” says Van Graan.

“Service, particularly customer relationships, is of high value to us, so it was an obvious choice to trust Arxada to oversee the installation of our Vacsol Azure treatment plant. Their technical knowledge and customer service are of vital importance to the success of our operation.”

TIMBER MERCHANT

The Peter Allan Building Material Trust was established in 1995 as a joint venture with Pennypinchers and supplied structural timber, laminated beams, ceiling and flooring to all Pennypinchers outlets. It manufactured and distributed trusses from its premises in Blackheath, Cape Town, to contractors and roof erectors throughout the Cape Town metropolitan, Boland, Overberg and West Coast regions.



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- 
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The product range on offer was further enhanced in 2003 when Van Graan joined as a partner in the business. They installed a finger-jointing, processing and treating facility that carries their SABS mark, transforming the company into a fully-fledged timber merchant.

CONTINUITY OF SUPPLY

Owing to the severe shortage of timber in the Western Cape, Thesen George, through its parent company PG Bison Southern Cape, acquired the Pennypinchers share of the joint venture. The trusses division was later sold to Pennypinchers.

Peter Allan Building Material Trust has grown from strength to strength in its sole focus of supplying corporate builders' merchants, private building material businesses, and truss and furniture manufacturers in the Cape Town metropolitan, Boland, Overberg, West Coast, Namaqualand and Namibia regions.

After ten mutually beneficial years, in July 2021, Thesen and the Peter Allan Building Material Trust amicably agreed on the terms for Thesen's exit from the partnership.

Trading as Peter Allan Timber, the company continued its focus on sourcing high-quality pine products and forging solid relationships with its suppliers to ensure continuity of supply for valued customers.

ARXADA

"The relationship we have built with Peter Allan Timber is based on a commitment to finding ways to add value to their business," says JJ du Plessis, senior regional sales manager for Arxada (trading as Arch Wood Protection South Africa).

"We are privileged to play a part in the success of their treatment plant. We supply quality, globally recognised and trusted wood preservation services. We appreciate the trust placed in our Tanalith C and Vacsol Azure brands and our technical expertise and customer service."

VACSOL AZURE

In 2012, Vacsol Azure wood treatment made its mark in the South African market as the first metal-free light



Arxada has installed a Vacsol Azure treatment plant at Peter Allan Timber in Cape Town.



Absolom Mngomezulu is the Arxada customer account manager for the Cape region. He remained on-site to oversee the installation and commissioning of the plant.

organic solvent preservative (LOSP) that meets consumer demand for green-rated residential and commercial applications products.

Du Plessis says it holds total market share as the only alternative

with environmental advantages over its predecessor solvent-based wood preservative products TBTN (tributyltin naphthenate), TBTO-L (tributyltin oxide-lindane) and PCP (pentachlorophenol). 🌱

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H6 – **High Hazard:** Prolonged immersion in sea water



FOR MORE INFORMATION ON ANY ASPECT RELATED TO TREATED TIMBER PRODUCTS AND THE CORRECT USE OF TREATED TIMBER, OR WHERE TO CONTACT SAWPA MEMBERS, PLEASE CONTACT:

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www.sawpa.co.za



New guide for analysis and design of mass timber structures

FP Innovations' newly published *Modelling Guide for Timber Structures* provides structural engineers and architects with modern and innovative design tools to facilitate the construction of taller and larger wood buildings.

The guide, developed in collaboration with more than 100 experts from 13 countries, comprises a wide range of practical and advanced modelling topics. It includes critical modelling principles, methods, and techniques specific to timber structures, modelling approaches, and considerations for wood-based components, connections, and assemblies.

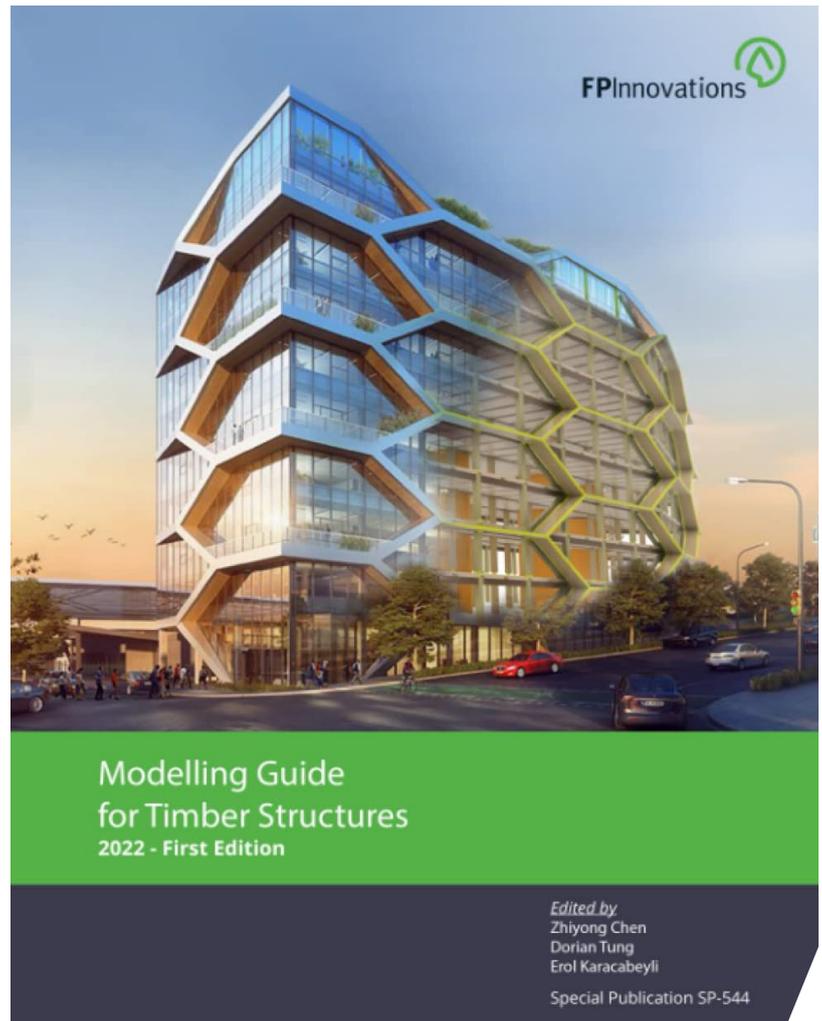
It provides analytical approaches and considerations for timber structures during progressive collapse, wind, and earthquake events. The guide also presents the differences in the modelling approaches to timber, steel, and concrete structures.

"Computer modelling is essential in the structural analysis and design of mid- and high-rise residential and commercial timber buildings and long-span timber structures," says Zhiyong Chen, a scientist at FPInnovations and co-editor of the publication.

"This guide was developed based on efficient modelling methodologies and analysis methods and provides valuable resources for advanced computer modelling of timber systems."

The Modelling Guide for Timber Structures is a must-have for structural engineers, architects, building officials, code enforcement officers, and software companies. FP Innovations is a Canadian industry organisation. 🌲

Source: web.fpinnovations.ca/modelling



WOOD PRESERVATION

ZERO ADDITIVES TREATMENT FOR RUBBER TIMBER

Wood scientists in China have commercialised a new "zero additives" process to treat rubber timber.

Freshly sawn rubber wood is susceptible to insect attack and blue stain. It requires early treatment,

usually with boric acid. According to *chinanews.com*, a Chinese research team has patented a zero additives treatment process to replace chemical agents.

The treatment cycle is shorter, and the colour and dimensional stability

are unaffected. The technology will gradually replace the current treatment process for rubberwood and "promote the development of rubber wood processing toward a safer and more environmentally friendly direction". 🌲

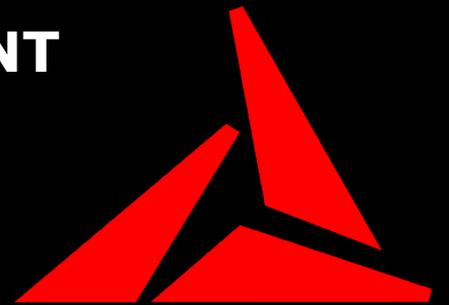


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Scion's five years of extreme fire research completed

Scion, New Zealand's forestry research organisation, has completed a five-year research programme on wildfires. The research validates the convection theory of fire spread. It changes how knowledge is shared on predicting extreme fire spread paths, fire prevention and tools for communities and firefighters.

It built on Scion's 25-year fire research program and deep forest ecology and management knowledge. In 2016, Scion warned about the risk of extreme wildfires in New Zealand. Since then, large tracts of land blackened, and homes destroyed

Scion's general manager for Forests and Landscapes, Dr Tara Strand, says New Zealand urgently needed new methods and tools for managing extreme fire, which sparked the research.

"The annual average direct impact of rural fire on New Zealand's economy is over NZ\$67 million, with indirect costs estimated to be at least two to three times this, plus intangible indirect impacts as much as 30-60 times direct costs."

In 2016, Scion received over NZ\$10 million in government funding for a five-year research programme to identify, mitigate and adapt to the growing threat of extreme fires.

Scion's Preparing New Zealand for Extreme Fire programme investigated four main areas:

- The convection theory of fire spread
- Decision support tools for providing real-time information
- New equipment and data tools for preventing extreme fire
- Targeted protection plans for communities and taonga (indigenous) species.

First, the experiments tested the emerging "convective fire spread hypothesis" and developed models and data analysis.

The world-class international team working on the project

included scientists from Scion, US Forest Service Missoula Fire Sciences Laboratory, the University of New South Wales, San José State University, US Forest Service Pacific Northwest Laboratory, Te Tira Whakamataki (TTW), and the University of Canterbury.

Burn experiments in cereal crop stubble and gorse scrub fuels validated findings that convection plays a significant role in wildfire spread. Fire spread by convection is when colder air sweeps in to replace the warm air rising at the fire front, pushing the flames forward to ignite the fuels and gases through direct flame contact. The previous theory was that ignition through radiation dominates fire spread.

Analyses of the data collected during the experimental burns began explaining the role of atmospheric turbulence in the transition to extreme fire behaviour. This new knowledge is included in New Zealand's fire behaviour training, supported by videos showing actual flame-front dynamics.

Two preventive strategies are of particular interest. A new heat sensors/automatic sprinkler system, and creating low flammability buffer zones using native plant species with big shiny leaves such as coprosmas, broadleaf and karaka.

The research team developed and tested fire alert heat sensors using existing technologies. It can warn forest managers and landowners of imminent danger from burn escapes and re-ignitions and automatically switch on sprinklers. The sensors can also monitor heat build-up, and possibly spontaneous combustion,

in forestry slash piles. It will be explored further in the following research programme.

Prototypes for several new firefighting tools were developed, including a smouldering hotspot temperature probe and a battery-powered backpack spray unit for preventing fire re-ignition and burn escapes.

Fire and smoke behaviour prediction tools are integrated into the NZ Fire Registry online public information and planning resource that supports operational decision-making for wildfires and prescribed burning. The fire registry tool predicts fire spread, smoke movement and health risks.

Scion reconstructed fire spread pathways and mechanisms of fire attack to fire-damaged properties. It surveyed over 60 homes for contributing factors such as nearby vegetation, lack of defensible space, construction materials, glazing, and presence of exposed wooden decks, outdoor furniture, firewood or other flammable materials. Visits were conducted to the affected sites within a week of the fire, and analysis was conducted over the following six months.

The results of this work to develop improved. The results inform guidance on how homeowners can reduce wildfire risk and new building design and construction materials guidelines for building in fire-prone areas. 🌳

Source: <https://www.timberbiz.com.au/scions-5-years-of-extreme-fire-research-final-report-released/>



By placing hives in its plantations, Sappi helps bolster honeybee populations that provide vital pollination services to the region.

Sappi's Lowveld eucalyptus forests are a hive of Naked activity

Bee Naked Honey Farm community beekeepers are placing hives in Sappi's Lowveld eucalyptus plantations to bolster the honeybee populations and provide vital pollination services to local farmers in the region.

Sappi is partnering with Bee Naked Honey Farms, a producer of local raw honey distributed under the Eat Naked brand. The team plays a significant part in sustaining honeybee populations, supporting the local honey industry, protecting the forests and achieving the shared purpose of a thriving future for all.

Bee Naked Honey Farms currently employs 14 people, 13 from the

Bushbuckridge communities in Mpumalanga. Most of them were unemployed and found their first formal employment when they were trained in beekeeping by Bee Naked Honey Farms.

The operational manager, Selby Mkgope, lives in Bushbuckridge. He has his own bees and has been running a chicken farm as a side-line business for many years. Mkgope

says that working with chickens has given him a better understanding and feel for beekeeping.

DWINDLING BEES AND TERRITORY

"Accurate data is limited; however, best estimates show that the demand for commercial honeybee pollination is set to increase by 15–20% per year in South Africa," says Mike Allsopp,

Bees need trees. Trees need bees. What has happened to the bees?

head of beekeeping at the Agricultural Research Council.

"There are already not enough managed honeybees to meet SA's pollination demand, and the amount of foraging territory available to honeybees continues to dwindle. It is easy to see why this spells trouble for our honeybees, food supply chain, and the complex web of life they support."

As demand for pollination services continues to grow, every avenue must be explored under a united front to sustain honeybee colonies. It includes the planting of cover crops in vineyards and other non-pollination-dependent crops, the restoration of fallow land, the establishment of woodlots, and the planting of bee-friendly forages in verges and suburbia.

POLLINATION ENABLERS

Allsopp says these actions will only be enough if we also protect and sustain two fundamental enablers of honeybee colony numbers in the country:

- The canola fields of the Cape in the late summer
- Winter-flowering commercial forestry eucalyptus of the Lowveld and KZN.

The crops are essential for beekeepers to trap and build honeybee colonies for the spring pollination season. Without them, South Africa would be in serious trouble.

SAPPI'S ROLE

Of the 394,000 hectares of Sappi-owned forests in South Africa, 163,000 ha or 63% are eucalyptus. That's roughly 30% of South Africa's eucalyptus output. Therefore, Sappi plays a pivotal role in the sustainability of honeybees and the pollination 'service' they provide.

As forests are essential, honeybees are vital to forest-dwelling fauna and flora, and vice versa. In a nutshell, bees need trees, and trees need bees.

Sappi's business is deeply rooted in sustainability, and the future of the beekeeping and forestry industries are interconnected. The company owns and leases 394,000 hectares of sustainably managed forests in South Africa, and its operations have a far-reaching, knock-on effect on people and the planet. 🌳



Albert Malope, Tshegofatso Komane, Mike Allsopp and Thandiwe Theko.



Selby Mokgope, operational manager at Bee Naked Honey Farms.



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sappi.com

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Preparations for LIGNA 2023 are in full swing, with 75% of display space booked

Despite extraordinary challenges, including rising energy prices, material shortages, and economic uncertainties in many markets, the woodworking and wood processing sector technology and services industries are preparing for LIGNA 2023.

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Around two-thirds of LIGNA's longstanding exhibitors have already confirmed their participation for 2023, with 75% of the available exhibition space booked. From 15 to 19 May 2023, the industry will convene at its flagship trade fair in Hannover, Germany.

LIGNA is the world-leading trade fair for the woodworking and wood processing sector. It showcases the entire range of products and services for the primary and secondary industries, including tools, machines and systems for custom and mass production, surface technology,

wood-based panel production, sawmill technology, energy from wood, machine components and automation technology, and machines and systems for forestry, round and sawn wood production.

"This positive trend underscores the importance of LIGNA for the



is a unique meeting place and a milestone for product development." In addition to the opportunity for face-to-face networking and presentations at exhibition stands, LIGNA 2023 also scores high with its focus on current industry developments.

According to Klaus Kullmann, a board member at Jowat, "sustainability is the central theme of our exhibition.

"By choosing 'Digitisation' and 'Wood in Construction' as its focus themes, LIGNA 2023 is addressing important sustainability aspects, presenting new and innovative solutions and reaffirming its position as the world's leading trade show for our industry," says Kullmann.

"For us, LIGNA is the perfect platform for face-to-face exchanges with customers and system partners, so we are delighted to be back as an exhibitor after such a long time."

Visitors can look forward to the following:

- LIGNA.Stage and discussions of highly relevant industry challenges
- LIGNA.Campus, where researchers and educators will present the latest topics
- LIGNA.Future Square powered by VDMA, allows startups to showcase their business ideas.
- LIGNA.Recruiting allows professionals and companies to present themselves in a digital job forum and exchange ideas in person in a matchmaking area onsite. 🌲

woodworking community as a key networking hub and platform for development and innovation," comments Dr Bernhard Dirr, MD of Germany's VDMA Woodworking Machinery Association.

"After four years, the industry needs this opportunity for face-to-face contact in Hannover. Significantly, all brand leaders have decided to exhibit at LIGNA 2023. The show's appeal is enhanced by digital elements designed to increase the event's reach – before, during and after the show," says Dirr.

Stephanie Wagner, head of LIGNA, says exhibitors look forward to the opportunity to perform live demonstrations of machines and tools, including total solutions covering all aspects of their products and services.

For Raphaël Prati, Biesse group marketing & communications director, LIGNA is a "must" event.

"LIGNA is innovative, it moves with the times, and it confirms the intention of companies to invest in the entire industrial sector, despite the current challenging times we are facing. It is a key reference point for the global woodworking industry," Prati says.

"Its success is its ability to adapt to changes in the industry and the latest technological developments. The five-day show is an opportunity to communicate face to face and engage with new physical and digital technologies."

For Homag, "LIGNA is the leading trade fair and a unique platform for presenting innovations to all target groups from craft to industry. We show the entire spectrum from individual machines to plants, software and services and get feedback for market-oriented further development from our customers and interested parties," says Achim Homeier, senior director of global marketing & product management at Homag.

Carola Lenkewitz, head of marketing and communications at Siempelkamp, says the personal encounters are the main focus:

"After so many years of waiting for our leading trade fair to return, we will finally be able to meet our customers, partners and all interested parties," she comments. LIGNA

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Geospatial Forestry Platform makes precision forestry accessible

Swift Geospatial is launching the Geospatial Forestry Platform (GFP) to improve and modernise the forestry industry with a comprehensive planning and monitoring solution for farm and plantation forestry.



The Geospatial Forestry Platform (GFP) is an initiative two years in the making. It combines Swift Geospatial's forestry monitoring and GIS (geographic information system) solutions with easily digestible information and data.

DECISION-MAKING

"The ability to provide key forestry decision-makers with a larger, more concise data set of relevant information will benefit the entire forestry value chain," says Michael Breetzke, founder and director of Swift Geospatial.

Established six years ago in South Africa's capital city, Pretoria, Swift Geospatial has grown its GIS and satellite imagery-based remote sensing monitoring client base to almost every corner of the globe. They monitor a wide variety of plant species in several countries and provide information critical for sector survival.

"Modern technologies can help track, monitor and describe the changes on our planet, and we believe the information should be more accessible to key decision-makers," comments Breetzke.

GATSBY AFRICA

Swift Geospatial is joined in its quest to positively affect the forestry industry by Gatsby Africa, an instrumental partner in creating the geospatial forestry platform.

Gatsby Africa is a private foundation established by Lord David Sainsbury to accelerate competitive, inclusive, and resilient economic growth in East Africa. It works with sectors across six portfolios, including commercial forestry, to create inclusive opportunities and jobs, improve incomes and reduce poverty.

Through its Commercial Forestry Programmes in Kenya, Tanzania and Uganda, Gatsby Africa has identified the lack of data as a critical

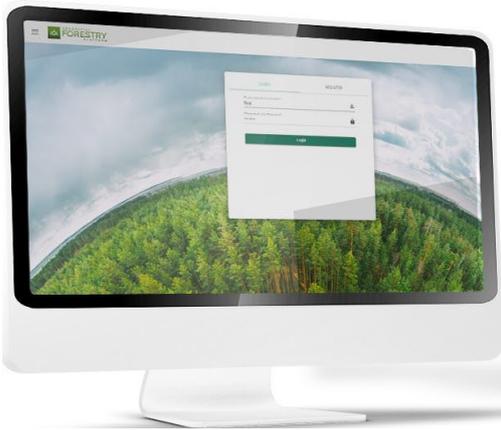
management constraint across the value chain.

The GFP makes essential decision-making information available to all tree growers. It supports their decision-making by linking species choice to the site, determining climate scenarios, and market objectives. The platform underpins a competitive, inclusive and resilient commercial forestry sector.

THE PLATFORM

The Swift Geospatial and Gatsby Africa partnership provides commercial farmers and tree growers with data and analysis to manage their resources and increase the efficiency and production of their industries.

Growers can, for example, know where to plant, predict future climate patterns and trends, monitor tree assets, and plan, track and manage diverse forest harvesting operations. The GFP is a collection of monitoring



modules accessible through easy-to-navigate GIS dashboards pulling and constructing data from high-quality satellite images. It provides free online modules to introduce geospatial tools ideal for small woodlot owners. For larger growers, there are more in-depth paid-for modules.

FREE MODULES

The free modules offer access to the renowned Sentinel Viewer, which provides 10-metre resolution imagery of their plantations and farms from the Sentinel 2 satellite. Joining the Sentinel Viewer is the site-species matching tool and a spatial layers module that allows users to study their areas of interest through numerous contextual datasets.

PAID-FOR MODULES

The paid-for GFP modules offer a broad spectrum of monitoring solutions.

FOREST MAPPING

The Forest Mapping and Query module is an essential cog in the monitoring solution. It locates and maps the tree resources or unplanted areas in a GIS. With the location known, the dynamic use of other spatial data for planning, logistics, and operational purposes becomes possible in additional modules, such as the Road Network Analysis module, which provides users insights for better logistical planning.

SITE SPECIES MATCHING TOOL

The Site-species matching tool (SSMT) is a powerful GIS-based tool

that overlays the growing conditions (based on temperature, rainfall, evapotranspiration, soil types, soil depth and topographic data) with the growing requirements of different species and matches them to different climatic areas.

It guides the forester in selecting ecologically suited species for a site instead of trying to modify the site for the species. With a simple four-range suitability legend, analysis is displayed dynamically on the GFP dashboard with georeferenced PDF maps available for download.

Gatsby Africa believes this module is invaluable for tree growers. The decision on which species to plant in a particular area is a critical determinant of the viability and potential productivity of a commercial forest plantation.

FOREST MONITORING

Coupling high-quality satellite imagery with Esri's premium mapping, processing, and analytics technology, the platform is an eye in the sky that can distinguish between different land use types such as agriculture, grasslands, built-up areas and various trees.

The health status of a forest is of primary importance. The average health status is not good enough because trees in different parts of a compartment may perform differently for various reasons. The Forestry Monitoring module provides continuous insight using satellite imagery supplied by Planet (3m) or Sentinel 2 (10m) for analysis. Planet's three-metre imagery is an invaluable

forest monitoring and infield stress detection mechanism.

NO NEED FOR A DRONE

Forestry companies need to know the stems per hectare in each compartment. The GFP lets you track the number of planted trees in all young compartments until canopy closure. It detects die-offs between counts, and imagery is available as historical or current imagery.

The platform is designed to be of use throughout the lifecycle of a plantation, from planning to harvesting.

POST-FIRE ANALYSIS

The extent of fire damage and the impact on the health of trees can be monitored with high-quality satellite imagery, providing before and after comparisons.

SUSTAINABLE FOREST MANAGEMENT

With dashboard modules that provide an overview of areas of interest and their surroundings, tree growers can begin the journey to sustainability by making informed decisions about current and planned forestry projects to meet market needs.

The Gatsby Africa and Swift Geospatial platform provide access to satellite-based data and analytics that will increase the efficiency and production of the timber industry.

Satellite imagery and mapping, processing, and analytics technology provide growers with information on what to plant where, monitor the trees, and lets processors plan, track



Healthy young tree.

and manage a disaggregated supply base. It also supplies climate pattern predictions and trends.

"The geospatial platform will contribute to unlocking the latent

potential in commercial forestry by providing timely and relevant information for decision-making," says Breetzke. 🌳

More info: www.forestryplatform.com and social media accounts

GFP LAUNCHES IN NAIROBI

The Geospatial Forestry Platform's official launch is in Nairobi, Kenya, in November 2022. The gala event will showcase the platform's applications to the East African forestry community.

The keynote speaker is Arthur Goldstuck, an award-winning writer, analyst, and technology commentator who also writes a weekly trends column for Sunday Times. He is joined by a panel of forestry experts keen to discuss their opinions and hopes for the platform's success.

"We know that positive platform adoption will significantly affect its ongoing success. With such an exciting product and more modules planned in the future, we are thrilled to officially launch the GFP," says Michael Breetzke, co-founder and director of Swift Geospatial.

Read about it in the next edition of *WoodBiz Africa* and Swift Geospatial's social media pages. 🌳



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- Reusable and user-friendly
- Available in natural white



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- Protects the sensitive terminal shoots of Christmas trees



Future foresters need different skills sets to embrace modernised silviculture

More than 300 people from South Africa, Brazil, New Zealand, Kenya, Australia, Indonesia and Mozambique attended Forsilvitech's latest webinar on "Enabling Modernisation in Silviculture."

The webinars provide information on modern technologies that can help improve and refine silvicultural practices.

After a brief welcome by Dr Kaluke Mawila, the Nelson Mandela University (NMU) George campus principal, the webinar facilitator Dr Muedanyi Ramantswana got down to business.

Ramantswana said technologies are emerging that are changing silviculture. Foresters are rapidly needing different types and levels of knowledge and skills to understand new technology platforms.

Automation, photometric, Lidar, geographical information systems (GIS), remote sensing and uncrewed aerial vehicles (UAVs) are increasing silviculture's accuracy, safety and efficiency.

"Although there is a need for investment in modern silviculture, we must bear in mind that technologies don't solve everything; we also need people to manage it," he stated.

NURSERY 4.0

Damien Naidu, nursery technology programme leader at the Sappi Research Centre, said the purpose of a nursery is to ensure that plants with the highest possible chance of survival are supplied to foresters. High-quality planting stock leads to optimum stocking and superior growth.

Naidu described the three pillars of nursery efficiency: the "golden goose" mother plant hedges that produce the "golden egg" cuttings and rooting. He explained how biodegradable

paper pots produce superior seedlings with root systems that capture the planting pit quickly and survive better in the field.

"Plug extraction is critical. Unskilled and high turnover labour can be rough on extraction from plastic inserts, resulting in root deformation. Planting the ellepot paper pot seedlings is easier, quicker and eliminates the sorting, cleaning and packing of the non-biodegradable plastic inserts," Naidu said.

"Better survival results in better utilisation of high-value planting stock and timber. Seedlings and cuttings must be dispatched within certain specifications for their species, propagation method and container size and type."

PQI, RPQ AND QR

Naidu explained Sappi's Plant Quality Index (PQI), where the nursery uses a fully integrated digital system and a LoRaWAN-like (long-range wide-area network) with multiple cheap sensors to increase efficiencies and automate processes.

It measures chemical, physical or biological parameters and allocates scores to infer physiological status. The data is used to manage water, irrigation moisture, stock inventory and assets.

The Rapid Plant Quality Assessment (RPQ) uses an iPhone camera and python scripting to automate plant height measurements within a nursery tray. The data provides information to develop growth curves and assist with automated measurement of plant quality. A QR code accompanies



Nursery 4.0 is a fully integrated digital networked system producing advanced seedling analytics.

every batch of seedlings from the nursery to the plantation.

Naidu commented that the nursery systems provide a way to predict good survival and growth after planting under normal conditions. Still, it isn't easy to correlate the data to predict survival to rotation age. "There are too many factors to consider. Tree survival includes the interaction between genetics, the environment, climate, site quality, nutrition and stand competition."



Thermal imaging of nursery trays. The purple colour indicates stress and the dark blue represents well irrigated plants.

STEEP SLOPE SILVICULTURE

Forestry graduate and contractor Dumisani Shweni of New Forestry Solutions shared information on mechanised planting on steep terrain. The company is working for Mondi in the Umzimkhulu area in southern KwaZulu-Natal.

"The terrain is steep and rocky. We had to adapt our operations to meet the site and Mondi's health and safety, ergonomics and productivity requirements by modernising our steep terrain silviculture systems," Shweni said.

PRE-PLANTING

The first step was to draw up the silviculture plan to match the technology with the site. Aerial photos taken by a drone were used for mapping the block and assessing the risk.

A DJI-T30-Agras drone executed pre-planting spraying. "Drone data is safe to acquire, accurate, and cost-effective. You cannot compare the information with that gathered by people on the ground," commented Shweni. He listed the advantages of drone-based aerial spraying:

- No slope limitations
- Cost-effective
- Accurate data
- More productive compared with manual methods
- It covers about 35 hectares per shift, making it possible to operate three daily shifts.

PITTING

Pitting was done without marking using Novelquip's dozer-mounted single-head MPAT pitting machine.

It worked two shifts a day, at two hours per hectare, compared with five person-days per hectare.

"People only enter the plantation area when planting, using selective chemicals and blanking. The drone limits people's exposure".

PLANTING

"Our wheeled tractor could only work up to 15% gradient while the dozer planter is a tracked hydrostatic driven machine that can plant on slopes up to 35%." The dozer has a carrying capacity of 1300 litres of hydrogel mix and a centrifugal pump to mix the hydrogel.

Eight people are needed for planting. Four people do the planting, two replenish the seedlings, one works at the sorting station, and one is the dozer operator. An average of four hectares is planted in an eight-hour shift.

Although mechanical pitting replaces about 20 people, it saves them from back-breaking work. Safety is still a priority because, in high residue areas, there is a risk of

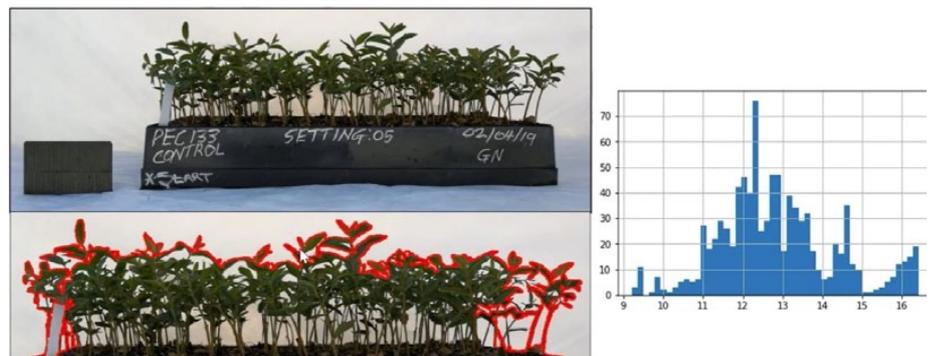
logs hitting people walking behind the planter. It is better for people to work on a burnt site with 10cm high stumps. If this is not possible, then a de-stumper is used. The drone helps us plan the harvesting system.

We are considering attaching the Wasser high-pressure pitting, planting and fertiliser application system to the dozer. We are also investigating mounting the planting head on an excavator to limit people going into high-risk areas on steep slopes.

UNEMPLOYMENT

A webinar participant asked how communities in forestry areas react to modernisation. "Nearly 34% of South Africans are unemployed, and mechanised systems reduce employment opportunities. Is there an increased risk of push-back by communities against technology and possible physical damage to growing stocks through arson and theft?"

"How does one responsibly employ technology to meet the company/contractor's needs while minimising the potential impact on the surrounding communities?"



The Sappi Rapid Plant Quality vision system assists with automated measurement of plant quality.

Shweni responded that adopting new technologies will inevitably lead to reduced employment opportunities as work gets done faster and more efficiently. "There will always be unemployment pressure. Our intention to modernise is to improve ergonomics and safety for employees. It is not about replacing jobs. There are opportunities for people to reskill and enjoy better work conditions and decent jobs."

DRONES

Sam Twala of Ntsu Aviation Solutions presented an overview of the evolution of the remotely piloted aircraft systems (RPAS) or uncrewed air vehicles (UAVs), commonly known as the drone industry, since 2015 and the challenges posed by cumbersome South African regulations.

The forestry industry uses the technology for fire detection work, mapping, crop-spraying and increasingly for forest health management. Investing in a drone equipped with remote sensing and machine learning with enterprise integration is costly, and the technology is changing rapidly. Twala advised forestry companies and contractors to also consider the cost of pilot licences and the impact of the SA Civil Aviation Regulations.

He discussed two examples where the regulations are clumsy. The latest drone technology lets one controller fly multiple drones. However, the regulations say one controller can only fly one drone. "It means that if you want to use five drones, you need five pilots, which is expensive," he explained.

Other sticking points are crop-spraying, Lidar and below-canopy work. "Operating under-canopy is low risk for people and property. However, civil aviation regulations are overkill and not practical or operation-centric."

SATELLITE IMAGERY

Michael Breetzke of Swift Geospatial's presentation focused on using satellite imagery to monitor forest operations.

"We are not foresters; we are geographical information systems experts specialising in extracting useable data from satellite imagery. We are based in Pretoria and work in Africa, Australia and Indonesia," Breetzke explained.

"Partners, relationships and technology are critical. The final product is a modern tool facilitating decision-making on a large scale; it does not replace people."

He said there are three ways of accessing satellite data:

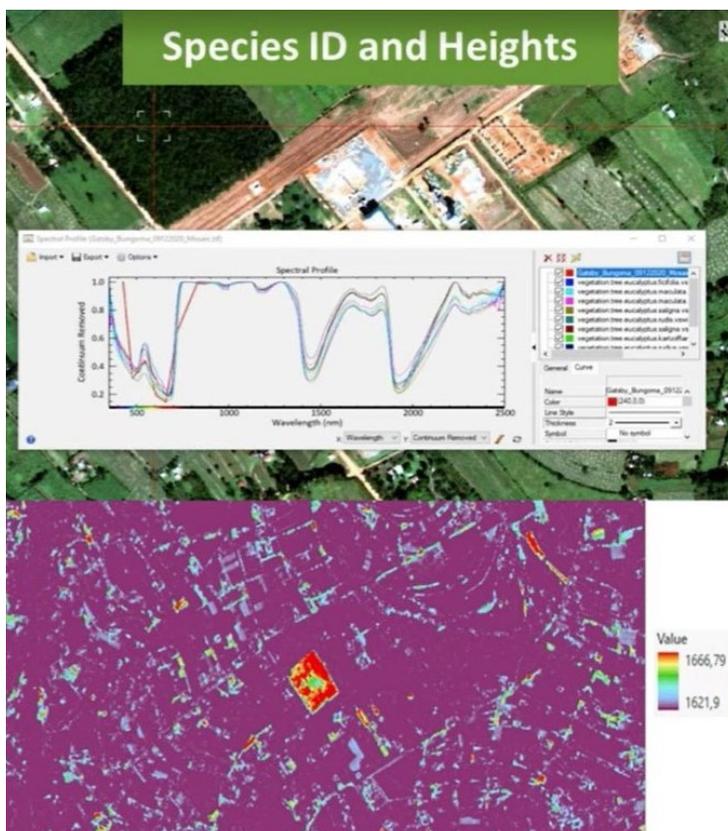
- Sentinel 2 data provides free image updates every five days.
- Planet provides daily 3m images
- Maxar offers high-resolution data down to 30cm and can, for example, present 3D data for determining the height of trees.



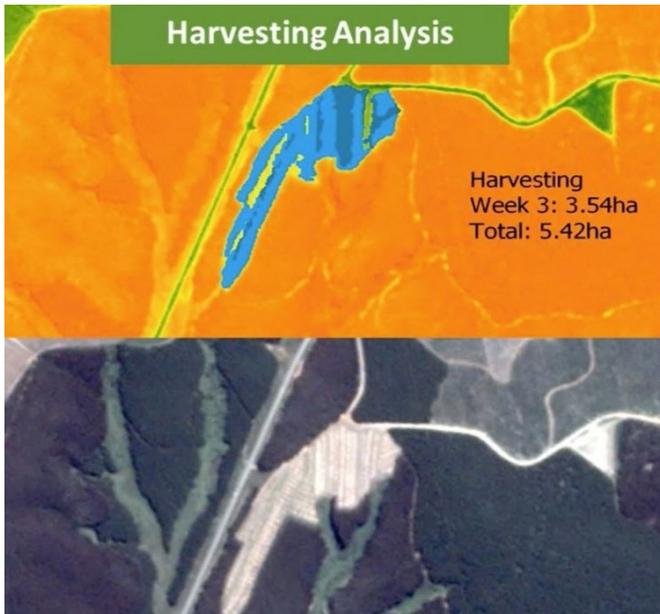
A drone was used to provide accurate planning and risk assessment information.



New Forestry Solutions performed pre-planting aerial spraying using a DJI-T30-Agras drone.



Drone data is used to identify timber species and heights



The harvesting analysis after three weeks

Swift Geospatial's services include visual dashboards of data on:

- Site Species Matching Tool
- Carbon sequestration
- Infield stress
- Weather forecasting
- Climate scenarios suitability
- Woodlot mapping and query
- Woodlot monitoring
- Tree survival rate
- Post-fire analysis
- Road network analysis
- New imagery requests
- Deforestation monitoring



Mechanised planting at Mondí Ncalu compartment.

BRACKE FOREST

Dr Rafael Ribeiro Soler of Bracke Forest in Brazil explained the century-old company's history and plantation forestry solutions.

Bracke Forest is a Swedish technology manufacturer recently bought from the Cranab group by Komatsu Forest. Soler said the excavator-mounted P12.b planter is ideal for southern hemisphere applications.

The standard carousel holds 196 seedlings (45mm), and the ripper rips to depths between 400 and 800mm. Accessories include tilt levelling, a slow-release fertiliser applicator and water and gel irrigation. At this stage, it cannot handle seedlings in paper pots.

DRONES IN BRAZIL

The penultimate speaker was Dr Guilherme Oguri. He is a forest engineer and executive coordinator of the Cooperative Programme for Mechanisation and Automation Forestry at Brazil's Forestry Science & Research Institute (IPEF).

The programme's objectives are to increase the quality and productivity of silviculture through mechanisation and automation. Drones are mainly used for pesticide



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applications and mapping using cameras and Lidar.

HE DESCRIBED THE FOLLOWING EXPERIMENTS:

Weeding using an XAG P30 2020 Serie 2 drone: Spraying glyphosate, saflufenacil or mineral oil herbicides for weed and eucalypt coppice control

- Application dosage = 10 litres per hectare
- Spraying velocity = 5,3m per second
- Application width = 4 metres
- Total area = 137ha

The result was an operational efficiency of 44% and productivity of 2,5ha per h⁻¹

Insect pest management using the same drone: Spraying imidacloprid and vegetable oil for *Costalimaita ferruginea vulgate* (yellow beetle) control

- Application dosage = 6 litres per hectare
- Spraying velocity = 8,4m per second
- Application width = 6 metres
- Total area = 43ha

The result was an operational efficiency of 47% and productivity of 8,2ha h⁻¹

Ants control using a DJI Agra MG-1P drone applying granular fipronil for *Acromyrmex spp* control

- Application dosage = 4,5kg per hectare
- Spraying velocity = 6,9m per second
- Application width = 7 metres
- Total area = 236ha

The result was an operational efficiency of 35% and productivity of 3,5ha h⁻¹

Additional quality control research determined the spraying width profile and spraying drift. Evidence of chemicals was found 4m – 64m away from the spraying target area, with less drift concentration further away. The damage caused was not evaluated.

TECHNOLOGY IN FOREST 4.0

The forestry general manager of Hexagon's Agriculture Division, Ronaldo Soares, rounded off the



The Bracke P12.b planter head at work in Brazil.



The Bracke planter accommodates 196 seedlings.

webinar. Hexagon employs over 20,000 people in 50 countries, with over 4,000 in R&D. His presentation looked at integrating modern technologies in forestry.

Soares advised companies not to rush out and outsource responsibility to a service provider without scoping the project. "Technology is not the 'silver bullet'. It would be best to decide what you want, when and where. You should appoint someone in the company to be responsible. There is a lot of information available

from many actors and several influencing factors," he said.

"For me, the biggest problem is the lack of standardisation and quality of forestry equipment research and technology manufacturers. The industry, its investors, technology developers and universities should work together to identify problems and find solutions.

"Globally, more has been invested in mechanised harvesting than in silviculture. It is time to talk about investment in silviculture." 🌳

Forest21 programme is developing climate-smart foresters

Forest21 is a collaboration of forestry departments and students at eight higher education institutions in South Africa, Norway, Finland, and Forestry South Africa (FSA).

Norman Dlamini of FSA is driving the project to develop a forestry curriculum that mainstreams climate-smart forestry and entrepreneurship in higher education. He is excited by the progress and multi-cultural and inter-disciplinary partnerships forming between students, academia, industry, and government.

The participants are:

University of Venda: Department of Forestry offers a BSc in Agriculture (Forestry Specialisation) degree programme.

Tshwane University of Technology: Department of Crop Sciences offers

a Higher Certificate in Forestry Management from 2022.

Fort Cox Agriculture and Forestry Training Institute: The forestry department in the Eastern Cape offers a three-year general forestry diploma programme at NQF level 6.

Nelson Mandela University: NMU's School of Natural Resource Management offers career-focused forestry and wood technology programmes.

Stellenbosch University: The only university in South Africa offering four-year BSc degree programmes in forest science and wood product science.

Häme University of Applied Sciences: The Evo campus houses HAMK, which produces BSc forest engineers (BSc), and the vocational institute HAMI trains forest workers.

Aalto University: The Aalto Global Impact unit fosters international collaboration. It develops research and educational outreach programmes for Africa, Asia and Latin America.

Inland Norway University of Applied Sciences: The forest management programme is offered at the Evenstad campus. The programme helps future foresters understand forest management in a practical and global context. 🌲

SHARP BLADE, SHARP TECHNOLOGY

The STIHL FS 460 C-EM K clearing saw has been designed especially for the tough working conditions of silviculture, with a chisel tooth blade for use as a saw in forestry applications. This is the most technologically advanced clearing saw produced by STIHL, and features the 'M-Tronic' fully electronic engine management system, which automatically compensates for variations in altitude, temperature and fuel quality by monitoring and adjusting the fuel-air mix for optimal performance in all conditions. With ErgoStart and simplified starting, a low emission, fuel-efficient 2-MIX engine and a 4-point anti-vibration system, this impressive machine is the perfect choice for forestry professionals.

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Daniel van Huyssteen of Bell Equipment with Hermann and Ernst Eggers.

Eggers Boerdery expands its Bell fleet with a Kobelco SK220XD

Hermann and Ernst Eggers, the fourth generation of timber growers at Eggers Boerdery in Mpumalanga, have a range of Bell Equipment machines, including five old 1766 haulage tractors and a new Kobelco SK220XD excavator.

In 1903 their great-grandfather Ernst Eggers arrived in South Africa from north Germany to pursue better opportunities. A master craftsman, he worked in the building industry in KwaZulu Natal before venturing into cotton and some mixed crops farming.

In the 1930s, he moved his family from Bishopstowe near Pietermaritzburg to the Mkhondo (Piet Retief) area and planted timber. He also farmed with pigs and had a Holstein dairy stud.

Their grandfather, Johannes, took over the farm and, in the mid-70s, bought Bell loggers, which at that time were constructed with round tubing. Bell 1206 haul tractors followed in the 1980s.

Hermann and Ernst's father, Berthold (Bertie), followed in Johannes' footsteps. Their sister Inge lives in KwaZulu-Natal.

"When I returned to the farm after studying forestry at Stellenbosch University, we resumed actively growing and harvesting timber. I recall

buying our first Bell 225A logger in 2003," says Ernst.

"That machine is still used daily, despite its chassis having seen some 26,000 hours of service along with three refurbished engines and some work on its boom."

Eggers Boerdery grows gum, wattle and, on a smaller scale, pine. The Eggers brothers have divided the work, with Ernst taking care of silviculture and planning and Hermann, a forestry graduate from Nelson Mandela University (formerly

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A Bell 225A logger loads one of the unstoppable 1766 haul tractors at Eggers Boerdery.

Saasveld), handling the harvesting and timber haulage.

They transport pulp logs to Richards Bay. Pallet wood goes to sawmills around Mkhondo along with pine saw logs. Some of the pine also goes to a mill in Eswatini. Wattle bark is sent to NTE at Iswepe.

"We run five Bell 1766 haul tractors, some of which we bought on the pre-owned market. For a good reason, they are very hard to find," Ernst comments.

"Bell Equipment has perfected this machine as a haul tractor configuration, especially when it comes to diesel consumption which is low at between seven and eight litres an hour, even when hauling 20 tonnes of timber."

Hermann adds, "You can't find these Bell 1766 Haul Tractors on the pre-owned market as people simply don't want to part with them. We had refurbished one and, as a test, advertised it on a popular sales platform where we had enquiries from as far as Zimbabwe."

The brothers agree that despite the 1766s age, Bell Equipment still supplies spare parts, which

stands them in good stead and adds significantly to the machines' longevity and reputation.

"Without these Bell 1766 haul tractors, we couldn't move our harvested timber to where it needs to be to get loaded onto long-haul transport. We have the reliability of the Mercedes Benz 366 motor to thank along with that Allison transmission which just doesn't break," Hermann says.

"We made minor modifications to the haul tractors, like replacing the rigid axle with an independent one. We're pleased that Bell is now fitting it to their new haul tractors," Ernst adds.

Eggers Boerdery also runs four Bell 225A loggers that perform various tasks, from loading felled timber infield to stacking and loading at roadside depots. Their fuel burn of between six and seven litres an hour is welcome.

Other Bell machines include a 315SK and a 315SL backhoe loaders (TLBs). "There is always work for a TLB on our farm, and we use them to repair roads, maintain drainage ditches and furrows and a host of other tasks," says Hermann.

"Their versatility is their greatest advantage, and with two big tools at hand, they are indeed convenient, even hauling our agricultural tractors out of the mud when they get stuck."

Despite the handy versatility of the TLBs, large rocks in the roads and the need for more harvesting capacity prompted the Eggers brothers to look for another multi-purpose solution. They turned to Bell Equipment for assistance.

"After consulting Daniel van Huyssteen at Bell, we opted for the Kobelco SK220XD-10 excavator. It is a boon for our general maintenance and harvesting operations," explains Ernst.

The 22-tonne excavator with its one cubic metre bucket has a superior hydraulic performance and adds value to the Eggers' timber harvesting applications.

"No machine can run forever without replacement parts, and we have a bin system in our workshop where we buy a new part from Bell's Piet Retief branch whenever we use a stock part. Bell's mechanic, Stephan Coetzer, is quick to handle all our servicing under warranty which gives us peace of mind," says Hermann. 🌲

Mozambique fossil forest among First 100 geological heritage sites

The Tete Fossil Forest in Mozambique has the most extensive area of Late Permian conifers, cycads and ferns in Africa. In October, the International Union of Geological Sciences (IUGS) listed it among the First 100 geological heritage sites.

Mozambique has the most fossilised Permian forest on the continent. It is among the six areas with the most fossilised forest in the world, along with South Africa, Namibia, Brazil, Antarctica and Zambia.

The paleontological site in Tete Province, also known as the Mágoè Fossil Forest, extends over 1,482 square kilometres. The petrified wood is well preserved, with trunks over 12 metres long, meaning the trees would be three times that height and over two metres in diameter. A few trunks are longer than 25 meters.

Many scientific papers have been published about the flora of the

Tete Fossil Forest. These include systematically identifying plant types which have yielded important new wood species diversity, fossil leaves and external wood structures, including tree fossil hollows.

Among the identified species are the *Glossopteridaceae*, a family of extinct seed ferns called *Australoxylon teixeirae* and the coniferous wood of *Agathoxylon Karoensis*, *Agathoxylon africanum*, *Zallesskioxylon zambesiensis*, *Cupressinoxylon* ("Cypress wood"), *Cupressinoxylon* and *Prototaxoxylon uniseriale*.

Geologically, the Tete province is represented by the Vuzi and Moatize

Formations, which comprise glacial and fluvio-lacustrine deposits, tillites, carbonaceous schists, and siltstones interleaved with coal beds.

THE GREAT DYING

The Permian period was the last gasp for early prehistoric life. The forest existed about 250 million years ago in the Late Permian period, which ended with the worst extinction event in the planet's history. The Permian-Triassic Mass Extinction Event, also described as the "Great Dying," wiped out more than 95% of life on earth when ecosystems were destroyed.

Various theories seek to explain this mass extinction. Some scientists think debris from a series of volcanic eruptions blocked the sun, which prevented plant photosynthesis and caused a significant drop in temperature. Food chains collapsed.

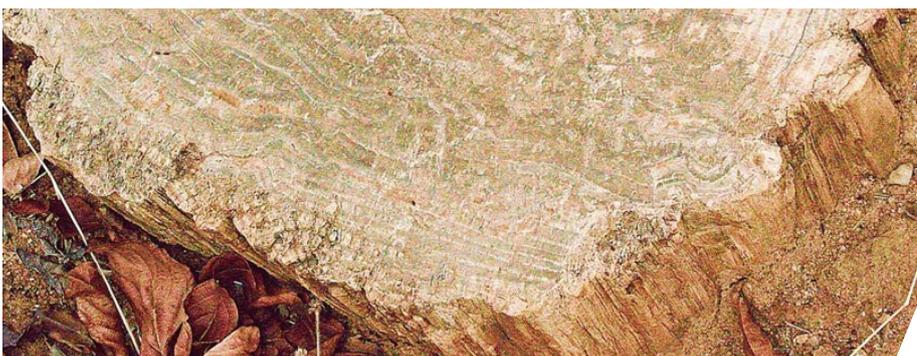
Other scientists point to global climate change, citing evidence of a period of rapid extremes of conditions when species could not adjust. Others posit a catastrophic release of methane gas stored under the seabed, triggered by earthquakes or global warming, or a massive asteroid impact.

THE IUGS

The International Union of Geological Sciences was established 60 years ago to correlate global geological successions and a shared common understanding of the history of the Earth. The IUGS stratigraphic chart is the global standard and underpins many significant geological findings and the economic development of the planet. 🌳



Petrified wood and scattered trunks in the Nhambando site of the Tete Fossil Forest. Pic by IUGS.



Late Permian Tete Fossil Forest example.

Locally manufactured counter tops

While granite and engineered stone kitchen countertops are perceived as opulent and nearly indestructible, they also come with a hefty price tag. Thankfully, high-pressure laminates (HPL) and melamine-faced boards (MFB) have come a long way since they were first popularised in the 1950s and 60s.



Today's offerings are far more durable and the designs more realistic and luxurious than the products available previously.

"Kitchen counter tops tend to take a beating and can often show age more quickly than other surfaces around the home," says Jason Wells, brand and marketing manager at PG Bison.

"People are understandably cautious when choosing their worktops as these surfaces need to stand the test of time and be moisture, scuff- and germ-resistant. But many people aren't aware of the

innovations and technologies that have been developed in recent years in wood-based panel products."

With improvements in digital scanning, printing, and manufacturing, the designs and colours available in HPL and MFB boards have become ultra-realistic, with options that capture the look of marble, granite, stone and timber, as well as solid colours, in a diverse range to suit every taste.

However, Wells says that often, the biggest concern that people have is moisture resistance. "Many of us have

seen chipped and swollen worktops in older kitchens," he says. "

But, with products like PG Bison's Formica LifeSeal worktops, it all comes down to correct installation to ensure minimal risk of swelling caused by water penetration. Plus, our proprietary LifeSeal strip, supplied on all Formica LifeSeal worktops products, stops water that has trickled down the front edge of the counter, from penetrating the worktop core from the underside. This gives you an extra layer of protection where it's needed most."



PROPER PROTECTION

To ensure that no water seeps through any gaps (like where the worktop meets the wall; or between butt joints and inside the cut-outs for sinks and stove tops), Wells says a water sealant (such as marine varnish or enamel paint) should be applied in a dabbing motion to the exposed core material of the worktop to create a proper seal.

"Applying two coats of the sealant, with appropriate drying time in between, effectively stops water ingress," he says.

"If you seal all exposed edges, your countertops should last for decades. To keep them in tip-top shape, regularly wipe down surfaces with a wet cloth and mild soap. There's

no need to reseal or polish these countertops, especially since furniture polish can leave a sticky residue. These worktops are designed to be low-maintenance."

HYGIENIC FOR HIGH-TRAFFIC SURFACES

Wells says that another little-known fact is that laminate surfaces are one of only four work surfaces permitted in clinical environments because of their hygiene properties, which makes them perfect for kitchens too.

"Thanks to the laminate manufacturing process, these products have what's called a closed surface. This means there are no microscopic openings in the surface where germs can take up residence,

making it the perfect solution for healthy, germ-free kitchens."

This year popular options in PG Bison's Formica LifeSeal worktops range include Woodland Fusion, Saxon Oak or Brooklyn Loft in the textured range; or Kristall, Catalan, Rosetta, Aquila or Tucana in the gloss range.

"Formica LifeSeal worktops are locally manufactured and therefore positively contribute to the South African economy. In addition, local production helps to manage the price point and ensure the product is readily available from all leading board retailers," Wells concludes.

"You get a stylish, international look without needing to pay heavy import duties and long-distance transport costs." 🌱

Funding and collaboration drive, and stymy, TIPWG's research

The increasing workload of South Africa's unique Timber Industry Pesticide Working Group (TIPWG) over the past five years is a testament to its value to the Forestry South Africa's (FSA's) members and the broader forestry industry.

By Joy Crane

TIPWG collaborates with industry and academic, public and private researchers and institutions in managing the risks of pests and pesticides and creating and maintaining a nurturing environment for plantation trees, from rooting to rotation.

Scientific research takes patient dedication, time, and collaboration to access target species and areas, appropriate measuring and analytical equipment and tools, and the need for funding.

The second annual meeting of TIPWG, held recently at NCT's venue in Pietermaritzburg, demonstrated the depth of data and knowledge that underpins SA's tradition of forestry research and the cohort of scientists responsible for the industry's sustainability.

Keith Little of Nelson Mandela University (NMU) summarised the past seven years of pesticide-use research conducted by NMU and TIPWG on behalf of FSA.

The four main research focus areas were:

1. Collecting and correlating data because it is a crucial tool for informing and directing research
2. Collaborating with industry and research partners
3. Revisiting past research to:
 - a. Show progress in reducing pesticide use
 - b. Link current pesticide use to management decisions
 - c. Re-assess all "treatments" to look for alternatives
4. Where pesticide use is key to staying in business:
 - a. There must be continual development

- b. Revisit known products that work
- c. Actively test alternative pesticides.

Little said chemicals that manage pests impact the target species and non-target, biotic and abiotic components. By nature, chemicals are potentially toxic and could shift ecosystem dynamics. They are, therefore, highly regulated.

However, silviculturists and foresters only apply chemicals to produce the desired response. Most stands receive direct and minimal chemical treatment, with no more than two or three applications during an entire tree rotation.

Little warned that despite the low rate of applications within an area, pesticides can still accumulate within a watershed as there may be many adjacent forest sites that receive applications. "This is significant because any pesticide used in SA's forestry industry must conform to ecological and legal constraints and the policies of certification bodies," he commented.

There are three main objectives for sustainable land use and certification:

- Identify and avoid "highly hazardous" pesticides
- Promote non-pesticide methods of pest management as an element of an integrated pest and vegetation management strategy
- Use pesticides appropriately.

"On the topic of certification, it is essential to remember that "certification only highlights and sets standards regarding pesticide use. It does not solve any issues resulting

from their use/non-use."

Little's review identified common "negatives" impacting research work since 2015:

- Companies that are not willing to collaborate
- Covid restrictions reduced research time
- Loss of trials due to events like fire
- Climate/trees/pests not co-operative
- The limited number of people active in pesticide-related research in the country
- The use of and availability of post-graduates from NMU and Stellenbosch University
- Chasing research funding to the detriment of achieving the overall research goals
- The Registrar of agricultural chemicals at the Department of Agriculture, Land Reform and Rural Development

Despite the "negatives", Little presented an impressive list of over 100 research-related project outcomes.

Much effort was focused on research and processes meeting certification goals, but not nearly enough effort was invested in understanding and finding solutions where existing standards have been compromised. "We have made a dent, but more work lies ahead".

DECISION SUPPORT SYSTEMS

Little highlighted two significant research contributions from NMU that support decision-making by forestry companies. The first was Jonathan Roberts, who could not attend the TIPWG meeting. He developed an



Jacqui Meyer. Pic by TIPWG.

invaluable Integrated Herbicide Financial Risk Model for plantation forests in South Africa.

Nxolo Ndlovu was at the meeting and presented an update on her doctoral thesis on understanding the soil and aquatic behaviour of pesticides in South African forest plantations. She studied a carefully chosen site adjacent to a river at Ingwe in KwaZulu-Natal for 26 months, from pre-planting to canopy closure.

Ndlovu described the various treatments and findings from water, soil, and sediment samples at different depths. The results confirm that sediment acts as a pesticide sink. Significantly, she found that despite glyphosate being the most frequently applied herbicide in all seasons, there was no evidence of it remaining in the soil or sediment, unlike azoxystrobin.

Ndlovu and Little said the results must be used cautiously because they are only for a single site and must be repeated over multiple locations in catchment areas. At the request of the industry, cypermethrin will be emphasised.

NURSERIES

Ilke Opperman's presentation identified the most prevalent insect pests and pathogens in local forestry nurseries and their control methods. These methods included commercially available pesticides in use and alternative less-toxic products to be trialled for forestry nurseries.

"Nurseries are an area where we still have much work to do. Chatting to manufacturers, many have stopped registration of products for nurseries. Due to this, the arsenal of nursery products is getting smaller and smaller," commented TIPWG's chairperson, Roger Poole.

"As much as we had planned to get both insecticides and fungicides covered in this

project, Covid came along, and we didn't have as much time. In addition, insect pests aren't always evident when you are ready for testing."

SIF FUNDING APPLICATION

TIPWG is finalising its funding application to the Sector Innovation Fund (SIF). The application is for a precision forestry approach to modernising pesticide testing, availability and sustainable use across the forestry sector.

It aims to expand the pest management toolkit currently available to the SA forestry industry to ensure continued productivity, GDP, employment and social benefits while minimising the sector's environmental footprint. The objectives are:

- Modernising current pesticide application methods, in line with the fourth industrial revolution (4IR), through precision forestry and innovative uncrewed aerial vehicle (UAV or drone) technologies.
- Identifying new pest management products that can fill current gaps or improve efficacy and environmental sustainability or minimise the risk to human health compared to currently available products.

NEW TIPWG COORDINATOR

Concluding the meeting, Poole announced that he is stepping down to devote more time to his NCT work. Jacqui Meyer is taking on the role of TIPWG coordinator.

Poole remains the organisation's agrochemical liaison. Katy Johnson is responsible for the organisation's communications, and Jolanda Roux coordinates TIPWG-funded research and develops new research proposals with stakeholder partners. 🌿



Noxolo Ndlovu collecting water samples. Pic by FSA.



Roger Poole. Pic by TIPWG.

Climate catastrophe or change – there is no middle ground!

"This could either be humanity's last century or the century that sets the world on a course towards a spectacular future," remarked Prof Eugene Cloete, quoting James Martin's *The Meaning of the 21st Century: A Vital Blueprint for Ensuring Our Future*.

By Joy Crane

Cloete is the recently-retired Vice Rector of Research & Innovation at Stellenbosch University (SU). He laid the groundwork for the Forestry & Climate Symposium organised by the university's Department of Forest & Wood Science in October.

He said the world is on a "non-sustainable path that could lead to disaster and even extinction". He reiterated the message from the World Economic Forum that the planet's carrying capacity is 1.2 billion people and not the 8 billion we will reach in mid-November 2022.

BEHAVIOUR CHANGE

As the migration of people from oppressed or resource-depleted regions accelerates, competition for resources and nationalism increasingly leads to conflict. Cloete said technology is not the only solution for managing the consequences of extreme weather conditions; behaviour change is necessary.

Prof Guy Midgley, acting director of the university's School for Climate Studies, agreed that behaviour change is the only way to manage the impacts of climate change. Midgley's reactions to speakers during the conference and statements in his closing address seemed to inject an element of controversy into the conference, which focused mainly on climate mitigation strategies.

CARBON TAX

Referring to the *En-Roads Climate Solutions Simulator*, Midgley said the average temperature of the

planet's current trajectory is an unsustainable 3.6°C by 2100. No matter the permutations you play with, the simulator confirms that the only way to get close to carbon zero by the end of the century is through "enforced compliance".

"Whether we plant three trillion trees and stop deforestation in the world, the simulations predict the temperature would decrease by only 0.011°C by 2100," Midgley remarked.

"If you increase the carbon tax price on the dashboard, there is a big step-change in the projected temperature increase. Our single most effective tool is to make carbon taxes high to force through the changes required to reduce the projected temperature increase by 2.6°C by 2100. We condemn our children to a much worse future if we fail."

CARBON ACCOUNTING

Michael Peter, executive director of Forestry South Africa (FSA), said South Africa's carbon or emissions tax came into effect in 2020 during the pandemic. The forestry and agriculture sectors were granted five years grace and must commence paying the carbon tax in 2025.

The legislation governing the reporting of emissions and carbon tax inside South Africa is the Air Quality Act 39 of 2004 and the Carbon Tax Act 15 of 2019.

Dr Jacob Crous leads Sappi Forests' land management programme and, since 2016, has calculated forestry carbon stocks for national GHG inventory and carbon tax reporting.

He described the company's carbon accounting system for its



Ben du Toit.



Brand Wessels.

greenhouse gas (GHG) emissions. It is a complex system of scopes and tiers that growers and contractors must incorporate into their management systems to report on after 2025.

All emissions and removals, above ground, below ground and in harvested wood products, are included. It includes emissions from any management action, including harvest residue decomposition,



Jacob Crous.

natural disturbance losses, and management of conservation areas. The baseline natural emission from grassland burning is not recognised.

Crous said the change in carbon stocks is calculated as the difference between the starting and ending stock. The actual carbon stocked in tree crops is not considered, only the change. Calculate forest carbon pools compared with carbon flows and the annual change in mass balance.

"We need a standardised accounting system across the industry. MicroForest and SAFAS can assist," Crous concluded.

RESIDUES AND SOILS

The department's Prof Ben du Toit referred to the government's suggestions for forestry activities that can sequester carbon. His presentation highlighted the challenges of dealing with harvesting residues, soil carbon content, and afforesting grasslands.

Du Toit said research is continuing, but at this stage, indications are that removing slash is not a viable option because it disrupts the nutrient cycle and incurs additional GHG emissions.

"Slash burning and under-canopy burning do not currently have large carbon tax implications for forestry and can still be used to good effect. Still, other ways of fuel reduction, like mulching and disking under trees, should be encouraged," he said.

When it comes to fertiliser, he recommended making the decision



Johann Goergens.

to use it or not on the likelihood of improved response rather than carbon tax calculations.

Du Toit also recommended that FSA avoids carbon reporting by publishing long-term results of fence-line studies. "A growing body of evidence shows that many decomposing forest floors trap more non-CO₂ gasses that they emit. This absolutely has to be taken into account when new legislation is proposed."

VALUE OF WOODY BIOMASS

Prof Johann Görgens of SU's chemical engineering department looked at alternate pathways for woody biomass. He said there is a significant global trend towards bio-based products, and "there are people out there with venture capital. It is a new paradigm for investment markets."

"Energy has the lowest value for investors. Rather than the known options, we should focus on higher-value bio-based products extracted from available biomass. Sustainable carbon will become a scarce commodity in future."

GREEN BUILDINGS

Prof Brand Wessels from the wood science division of the department said Dr Phillip Crafford's research confirms that wood is better than bricks and steel when considering GHG and carbon sequestration of buildings.

Wessels said consumer behaviour has changed in the UK



Michael Peter.

and Europe, where demand for timber and engineered timber building components is increasing. Every year SA builds an average of 54,000 houses using conventional raw materials. These buildings are responsible for the most significant slice of energy-related carbon emissions.

"Electric vehicles are a drop in the ocean compared with building with wood. Why does the carbon tax not apply to cement?" he asked.

The forestry sector must collaborate with stakeholders in promoting wooden buildings and the use of engineered timber. "We urgently need to get this information into the public discourse," Wessels commented.

Considering that local demand for saw timber is already outstripping the supply, we must add value to plantation resources and support the construction of green buildings.

CARBON SCRUBBERS

Our forestry sector is a small emitter of greenhouse gases. "We are locking up CO₂ in our plantations. We want the government to accept that biomass is carbon neutral. We don't want plantations to be regarded as carbon sinks. We are carbon scrubbers," Peter stated. 🌳

Ed's note: Read part 2 of this report in the November issue.

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