

Transcript

Episode 26:

Big tick for FWPA supported research centre to continue vital work

Georgia

Hello again WoodChatters and welcome to the latest episode in this Forest and Wood Products Australia podcast series. I'm Georgia.

Sam

And I'm Sam. And today we're going to be taking a deep dive into the evolution of the National Centre for Timber Durability and Design Life, an important FWPA supported research initiative and partnership between industry, academia and government.

Georgia

The Centre was established back in 2017, and since then, from its base at the University of the Sunshine Coast, has worked to place Australia at the forefront of international best practice and underpin customer confidence in the performance of timber products.

Sam

If this all sounds a bit familiar, that's probably because this isn't the first WoodChat episode to focus on the operations of the Centre. So, before we press play on this episode, let's hit the rewind button by four years.

[Rewind sound effect]

Georgia

Way back in 2018, we sat down with Professor Jeff Morrell to talk about his recent appointment as Director of the newly established Centre and what he hoped it would achieve for the industry. You can hear more about those early days of this initiative by scrolling back to episode three in the WoodChat feed and checking out the full interview with Jeff recorded at that time.

[Fast forward sound effect]

Sam

And fast forward again by four years. 2022 saw a mid-term review of the Centre conducted by FWPA board members, which resulted in the extension of its activities for a further five years and with the potential for three more.

Georgia

The review found the Centre has made great inroads in working with industry to ensure Australia has access to the world's leading research and best practice, while building strong links between industry, academia and customers.

Sam

That's right. The review panel concluded that the Centre had successfully completed its establishment phase through the development of a coherent research program, employment of staff and initiation of significant activities.

Georgia

And so, once again, Sam sat down with Professor Morrell to touch base on the team's progress and discuss the Centre's ongoing evolution.

[Upbeat intro instrumental music]**Sam**

Since we last spoke for the WoodChat episode four years ago, how have things at the Centre been progressing?

Jeff Morrell

Well, it's hard to believe it's been four years. Because I think of where we came from, you know, when you start something new and there's a lot of growth and trying to figure out what people are doing. And I think the first couple of years were really about working with the partners to see what they brought to the table and how they could interact.

And I think we worked pretty hard at that. And I think we've come really far in terms of identifying the strengths of each partner. And we've sort of carved out our niches and figured out how to cross collaborate. The other part was engaging students and postgraduates and starting to educate the next group of people in this field.

And I think on that we've been outstandingly successful. We have 11 students in progress between University of Queensland and USC. Our first PhD student will submit his thesis tomorrow.

Sam

Well, it's been a kind of an ongoing issue for quite a few years now – the declining research capacity in this space in Australia. Whereabouts are we now on that journey, would you say?

Jeff Morrell

There has been a resurgence in timber interest in the country, and I think that's probably the most exciting part of what's happening. And it has a lot to do with strategic funding across the country. And so, if you look at UTAS and Uni SA, they both have NIFPI funding and that's allowed them to engage students. And we have FWPA funding that's allowed us to engage students.

And so, I think we're slowly filling the bucket back up, but it's going to be early career bucket. And so, it'll take a while to get those more senior scientists or even middle level scientists engaged in in timber. But I think we've started the process.

Sam

Yeah. So, it's definitely building a solid foundation for the future. And that added interest in timber that you just mentioned before, what would you put that down to? Do you think that more that people and industry and that sort of general community have more of an emphasis on sustainability? Do you think there's an improvement in the understanding of timber as a sustainable product?

Jeff Morrell

I think it's helped. I think it's created a little bit of buzz in some of the communities. I don't know that that's why we're seeing what we're seeing. I think the cycle has come around again and I believe that, you know, industry and government have finally realised that they under-supported that segment. And so now they're looking at it and saying, okay, we have to fix this problem.

And I always find it interesting that that this region is the number two timber user per capita in the world. And so, I think people are recognising, well, this is important. The mass timber movement, I think has helped that a lot. But I think people start recognising they've sort of not paid attention to this area and they need to.

Sam

I just wondered about the other two audiences, I suppose, in terms of industry and timber customers. And I just kind of wanted to see how that side of things might be progressing.

Jeff Morrell

And that's part of what the next cycle is going to be about. Engaging better with industry, making sure that we outline to them what we're doing and why it's valuable to them, I think are probably critical right now. You know, we started off getting out to industry and talking to them and engaging them just by visiting, which I think is helpful.

The first you know, the first time you want to engage somebody, you should go there. COVID, sort of, interceded in that movement. And we're just getting back now to where we wanted to be. But we've also tried to engage timber producers and some of the users with workshops. And so last week we actually hosted a Statistical Process Control Workshop for a mixture of composite solid timber producers up at USC.

And those kind of things help. I mean, and that's sort of middle level timber processors. But the idea is we engage them, we start to identify some of the problems we're having. So I think the other part of the engagement is going to become important will be that, as part of the renewal from FWPA, we'll be establishing an advisory committee, which will consist of solid timber and composite producers, plus chemical suppliers and the general user market, to kind of gauge their sense of what we're doing, but more just to make sure we're in the right direction and to help

make sure we stay kind of true to what we say we're going to do. That we're not doing things that have no relevancy.

Sam

And so, with those events and workshops that are hosted for industry, do they serve a kind of a double purpose? So, I suppose on one hand, would it be sharing information from research that has kind of been ongoing that would be useful for industry? And then on the other side of it, you get insights into what the industry's main issues and concerns might be that future research could look to address?

Jeff Morrell

I think it's both of that, and it's also a little bit of waving the flag and showing people that we exist. And right now, it's really easy to get lost – we're a big country. Everybody's got their own agenda for things

they need to solve. And getting a group away to kind of see what their issues are is important. So those are those are helpful.

And the other part of that is we need to start getting out again into the into the actual field and visit locations. A lot of what we have done came about because we were out someplace. For example, we're doing this large assessment of the software and resource for its treatability. And the reason we came upon that was because we did a workshop in Mount Gambier and turned out to be a great place to collaborate, and we would never have found that out if we hadn't been there.

Sam

Other any upcoming projects that you're particularly excited about?

Jeff Morrell

It's not something we talked about when we first started the Centre, but it sort of emerged as a big issue is the circular economy. The whole idea is that we have all this material treated timber and composite material that is being used now. But enters the waste stream, and it becomes much more difficult to dispose of because people look at the chemicals and they just immediately say, "Oh, that's CCA. It's got to go to a hazardous waste site," and it becomes very costly.

And we've been working with a consortium to sort of explore the volumes of materials or risks that are out there, the regulatory aspects across the country, to sort of come up with strategies for how to reuse these materials so they're not winding up in the landfill, and we can either gain value or not have cost from them.

We have about ten industry co-operators involved with this, including one of the other peak bodies, Wine Australia. We are now progressing this through FWPA. It will be a project where FWPA will match the other industry funding. It's actually driven by the users. The wine people came to us, who was keenly involved in this because the vineyard costs, they dispose of about a million vineyard post a year, and it's a real problem.

They're faced with this pressure from their growers who are saying, okay, how do I deal with this posts? What do I do with them?

Georgia

As mentioned by Jeff, as part of the Centre's work, the team has orchestrated a range of stakeholder meetings around the country to discuss its operations, objectives and projects, as well as to answer questions and identify pressing research priorities. These consultations have guided the initiation of more than 20 exciting research projects.

Sam

Research overseen by the Centre to date has focused on everything from treated wood quality to fire impacts, timber field performance, termite biology, moisture behaviour, coatings performance and much, much more.

Georgia

One specific project that Jeff suggested we delve a bit further into is a partnership between the Centre and the University of Queensland with fire science expert Dr Felix Wiesner at the helm.

Sam

Georgia sat down with Dr Wiesner to discuss how he has used his skills to develop insights around smouldering and timber durability in bushfire prone areas.

[Upbeat music plays]

Felix Wiesner

One of the things you obviously need to consider when working with timber is that it's combustible and fires do happen. They affect timber in a different way than they affect steel or concrete. And my role within the Durability Centre is to address issues that arise for the design life of timber from exposure to fire.

So, for example, one project we looked at, is the use of what we call bushfire resistant timber, so that means you can use them in certain bushfire attack level regions for construction. These sort of timbers delay ignition and, even if they ignite, the heat release rate is not considered enough to spread the fire along a building, so therefore you're allowed to use them. The list of these bushfire resistant timbers is quite limited. So, we looked into different timber species from far north Queensland. We looked at different densities, we looked at extractives, different species, and we tried to find out what makes a species bushfire resistant.

Georgia

And what are the outcomes of that project. What sorts of insights did you gather?

Felix Wiesner

Firstly, we looked at the standard that's required to be passed to classify a wood species as bushfire resistant. And then we subjected different species to the test requirements to try and meet that standard. And we found out that of all the species we tested none of them actually passed that standard. Although there was one species, the Cooktown Ironwood, even though that one didn't pass the specific test requirement, it took up to 20 minutes to actually ignite.

And if you actually look in the in one of the codes, it says you can finish the test after 10 minutes. So, the next step would be to recommend that species to be included in the list.

Georgia

Presumably that has all sorts of potential benefits for the Australian forestry industry, like providing confidence about compliance and safety to people working with timber in bushfire- prone areas?

Felix Wiesner

Exactly. I mean, there's still a limit. So, for example, if you have a very severe bushfire, any sort of timber will be damaged and will contribute to the fire. Luckily in Australia we have codes and standards and experience in trying to predict the exposure.

But coming back to your question in terms of the need for this research and the outcome, yes, you're right that the idea is to give people more confidence and also to help those timber species to basically increase their value.

Because at the moment, because the existing list of bushfire resistant timber species is very limited, those species are in high demand and by providing alternative species that can be used, we can spread

the load of demand a bit. And we can help local economies, for example in northern Australia, to increase the value of their wood products because suddenly they can be used in areas where they couldn't be used before.

Georgia

And did I see that you've also done some work around the impact of certain wood treatments on fire durability?

Felix Wiesner

Yes. So, we have another project that looks at the fire performance of durability treated timber. Basically in Australia, if you look in our cities and also in rural landscapes, a lot of our utility poles consist of durability treated timber. Usually what we use is copper chrome arsenate, CCA, basically the copper and the arsenate provide resistance against the fungi and insect attack, and the chrome binds the chemical to the timber. What CCA does is it extends the lifetime of timber in the field.

Felix Wiesner

So, if you can reduce the time span where you have to replace these pieces of infrastructure, you're saving resources. What happens with CCA treated timber is that if a fire passes through, it can be a relatively small fire the timber will burn and char a bit, but it will not be damaged to the extent that it that it collapses or fails or is not usable anymore.

But then, after the fire, we have smouldering phase that will keep deteriorating the timber until it fails and turns to ash. And CCA really limits the threshold for when smouldering will occur. We found out the higher the density, the less likely it is that you get smouldering. We also looked at how fast the smouldering progressed.

The next step for us will be to look at the concentration, to look at different treatments, possibly different timber species. Are different timber species less or more likely to lead to smouldering? In most standard wood, adding CCA will increase the likelihood of smouldering.

Georgia

When it comes to the outcomes of your work around smouldering, how will those insights gathered be used for the benefit of the forestry industry?

Felix Wiesner

One of the bigger outcomes from this project, in my opinion, is the actual test methodology we have developed. If someone from industry comes to us and says, "We have a new formulation of their durability treated timber. We know it works for durability, but we would like to test the effect of potential smouldering after bushfire", we have basically provided a template that can be used to assess smouldering for a certain chemical or timber chemical combinations.

So, we provide knowledge, we provide testing methodologies and ultimately the idea is to then use all these aspects to inform both the manufacturer of chemicals, the timber producers and the end user. Okay, what can we do to minimise the risk of smouldering?

Sam

During our chat, Felix also acknowledged Mr Wenxuan Wu, the PhD student leading the work on CCA treated timber, for his contribution.

Another project Jeff suggested we learn a bit more about was part of a research collaboration between

the Centre and the Department of Agriculture and Fisheries involving field trials that will help improve service life prediction models for various timber materials used for outdoor applications.

I spoke to research scientist Dr. Maryam Shirmohammadi and Lesley Francis at the Department of Agriculture and Fisheries to find out more.

[Upbeat music plays]

Sam

When this collaborative arrangement was initially set up, what were the research priorities that you were looking to address?

Lesley Francis

In a nutshell when characterising timber durability performance, providing data for durability modelling and working on surface prediction optimisation. The research conducted aims to provide more reliable durability performance prediction for timber building products.

Sam

This extensive timber durability field testing work that we've been hearing about out of the Centre, I wondered if you might be able just to give me a little bit of an overview as to what that project is all about?

Lesley Francis

So, we've got field tests established throughout the country to look at timber that's exposed to the weather in service. Some examples of the type of field tests we've got are joinery and decking. But as part of the Durability Centre, we were able to set up a really cool new large scale field trial. And so, we've set out about 8000 timber specimens and will be able to monitor their performance over time.

Maryam Shirmohammadi

This field trial has designed around looking at extreme and high decay hazard service classes. We're looking at tropical and subtropical environment, which are very important for Australian product and Australian climate, and that all of that data will be useful for future model development.

Sam

What sorts of issues or problems was the research project designed to help address or overcome?

Lesley Francis

Timber is a biological product. It's got outstanding, unmatched environmental credentials, but as a biological product it is subject to decay and insect attack if exposed to conditions conducive to that.

Maryam Shirmohammadi

Because moisture is the biggest risk factor in causing timber decay, we are also investigating properties of Australian timber species exposed to moisture conditions, especially during and post construction. We're interested in the differences between the species as well as engineered wood

products.

So, the trial includes a whole range of different products as well as range of products using different treatments. Some of the specifications are intrusion of modified wood, treated wood, engineered wood products as well as the more traditional solid wood products that we have already included in the field trial. So, it's a very good addition to our existing trials, answering some of those questions that new products and new treatments might create.

Sam

Is that to then be able to give the end user more confidence in how those materials can be used?

Lesley Francis

Absolutely.

Maryam Shirmohammadi

And a bigger picture of the trials and the data that we are collecting is to actually provide enough information, or reliable information, that builds confidence to use timber in the building industry and give the industry and also the end user the required information to make the choice of using timber.

Sam

From a practical perspective, what has the work looked like so far?

Lesley Francis

So, we've got above ground and in-ground tests the tests are generally accelerated, the decay moves faster in the field test than it would in a protected deck or joinery or most timber in structures. But it gives us a realistic pattern of the way decay would progress.

Georgia

Fascinating stuff. It's clear the Centre has already led some vital research projects and provided significant value to the Australian forest and wood products industry, not to mention starting the vital process of rebuilding Australia's capacity in timber research.

Sam

Absolutely. And with so much great stuff achieved in its first few years, it will be fascinating to see what the next cycle of the Centre's life brings.

Georgia

It's definitely going to be one to watch. Well, that's just about it for another episode of Wood Chat. We hope you'll join us again next time.

[Upbeat outro music plays]