# Science to Practice Forum 2023

Day 2 Session 2 transcript

(Duration 70 mins 47 secs)

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## Introduction

This is the transcript of one of the Future Drought Fund’s Science to Practice Forum sessions, presented by the Department of Agriculture, Fisheries and Forestry. This transcript is for Day 2 of the Forum, session 2, Planning for profitability and productivity in a changing climate.

Learn more about the [Science to Practice Forum](https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/research-adoption-program/science-to-practice-forum).

## Transcript

[Recording begins]

Pip Courtney [00:00:10]:

Farmers and hydrology specialists, like the ones you just heard from, take a keener interest than most in the weather forecast, the seasonal outlook ahead and the bigger picture in terms of climate patterns. So too does Professor Roger Stone and emeritus professor in climate Science at the University of Southern Queensland and the chair of the United Nations World Meteorological Organization.

Roger Stone [00:00:37]:

Well, greetings. My name is Roger Stone, I’m Emeritus Professor in Climate Science and Meteorology at the University of Southern Queensland in Toowoomba. 30 years ago, I was on the bank of the Fitzroy River, and the Fitzroy was in flood. And I was speaking to a well-known grazier in Central Queensland, and he said to me, you know, most of our droughts start and finish with a flood like this one. This is in 1991, right? Most of our droughts start and finish with a flood. Well, that was quite interesting. And we had five years of drought just after that, just by the way, that’s an interesting sort of comment. So I did a little bit more research on this, and sure enough, the psychic nature of El Nino and La Nina, which most of you have heard about the cyclic nature, where we go from La Nina to El Nino, then back to La Nina again.

There might be the occasional neutral year in between, but that cyclic nature shows that you can recharge the whole Pacific Ocean system when you’re having a La Nina, just like we’ve been through for the last three years. That provides a lot of the recharge for the El Nino that’s going to follow. And as we know, El Nino usually, but not always, gives us quite severe drought in many parts of Australia. So my grazier friend was onto something there that we need to be planning for the drought right back when we’re having the floods. It sounds almost counterintuitive. So instead of saying, well, the good years are back, in fact that’s probably the last good year you have for a while. And we go back to El Nino. And likewise, when we’re in the middle of an El Nino drought, like we were in 2019, in the middle of a fairly severe drought, we’ve usually, but not always, got a La Nina wet season coming in the year or so following that.

So one follows one, which follows the other. And that’s an important feature. And in fact, if we look at some of the sea surface temperatures from last year and then compare to what’s happening now, you can see this fairly massive La Nina in the Pacific and the Central and Eastern Pacific there, this cold water, the blue area there from the Central and Eastern Pacific to the South American coast. Now you can see that being replaced by this El Nino pattern that is primed to take over from about our winter onwards or maybe a little bit later. But the Pacific Ocean is now primed to go to an El Nino. Well, so what? Another story I have is back from 1992 and I was speaking to some grain growers in Goondiwindi, a very well-known grain growers said, yeah, we know all about this El Nino stuff.

We’ve been listening to this on the radio and, and so on and so forth. But you know what he said? He said, what’s the first thing I do when I get back home? What’s the first thing I do when I get back to my property? Right, this is a well-known grain grower around Goondiwindi, Bungunya, that way. What do I do? So that brings the whole point of none of this information, none of this climate information is really any value unless it changes a management decision. None of it has any value unless it changes a management decision. Otherwise, it’s just scientists talking to themselves. So a key question now for all of us is, well, what management decisions can I make with an El Nino primed in the Pacific at the moment, which usually gives a drought for many parts of Australia? What do I do?

What do I do when I get home? That’s a key question. Not only what’s going to happen on the property, but what about all the other, all the other factors down at the supply chain. What about the transport operators that need to know about this? What decisions are they making? What about the seed merchants and the millers and the processing factories and so on, processing plants and then the decisions that the marketers and the exporters make? They’re all hinging on this as well. Of course, we don’t talk to each other very much about this. So there’s a lot of people there whose decisions are based on what’s happening now in the Pacific Ocean and the Indian Ocean to some extent. And there’s actually another 10 patterns out there we need to know about southern annual mode and the quasi-biennial oscillation, subtropic ridge and the Madden-Julian oscillation, the heaps of them and a bit of climate change as well, of course. All those factors going on at the same time, which should be incorporated into the climate models you’ll probably be hearing about during this meeting. So the key thing is what decisions can we make with all this information because otherwise it has no real value. Now, with that, I wish you well. Thank you.

Pip Courtney [00:05:23]:

A great reminder. That was Professor Roger Stone, Professor Emeritus in Climate Science at the University of Southern Queensland. Now we’re crossing to Launceston, my hometown in Tasmania to hear from Roly Chugg, a Senior Rural Financial Counsellor for Rural Business Tasmania. Roly’s been a Rural Financial Counsellor for several years, and before that had 26 years in the banking industry. He’s also run his own farm for 25 years. Today, Roly will talk about his experiences as a Rural Financial Counsellor and the importance of farmers making their own enterprise resilient and better prepared for risks. And you’re invited to put questions for Roly into Slido and he’ll get to as many as he can after his presentation. Over to you, Roly.

Roly Chugg [00:06:12]:

Yeah, thank you very much Pip. Yeah, first of all, I’m very grateful that I’ve been given the opportunity today to give my little presentation. As the intro probably said, I’ve had 26 years in the banking industry, 25 years of running and owning my own farm, and now I’ve been lucky to have the last 10 years as a Rural Financial Counsellor. So as a Rural Financial Counsellor, I must admit, when I had my own farm, I had no idea that the Rural Financial Counselling Service existed. So it is a really good tool for farmers to access. It’s available to farmers, but I just wish I knew about our service years ago when I was farming. There’s a number of things as the Rural Financial Counselling service, the good thing too is that we’re Australia wide, wherever you’re listening from today, whether you’re with New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, there’s people like me all around the country, which is fantastic for the farmer to access the sort of things we do and can help the farmer. It’s a variety of things we can do. So I’ll just sort of run through some of the things that we can do and which farmers can tap into and use our experience. So just running through the activities we do, we can help with succession planning. So I’ll just run through and I might just give a few little examples how we helped, as I go through each of the items we do help with. So we do succession planning, and sometimes with succession planning, it’s not done early enough.

So often the farmer leaves it a little bit too late, but instead of doing it when they’re in the forties or fifties and working at a plan of attack down the track, sometimes a farmer will leave it to late in their seventies and eighties and quite often then it’s a bit hard for them, it sort of gets beyond them. They get too old. So we as a service, we can actually chair those meetings, help the farmer get through the succession planning issues. Because sometimes it’s not always smooth sailing. I know, just a couple of examples, I’ve had one where the Mum and Dad were handing a farm down to three sons, but then the three sons were arguing over it. One wanted to change it to dairy, one wanted to run beef and the other one wanted to do something else.

So you have those sort of issues. And another time I had a Mum and Dad that were handing the farm down to four daughters actually, and Dad wanted to just divide the farm by four, like 250 acres each, but the eldest daughter, wanted the lot for herself. So you’re dealing with those sort of issues. We also help with farm debt mediation. We’ll go and meet with the Bank Manager and sort of assist in those areas. We help also with cash flow forecasting. So if the bank needs a projected cash flow, we can assist the farm, put that together. We’ll help with loan applications. So if they’re applying for a federal agriculture loan or a federal loan or a state loan, or just a loan at their bank, quite often they’re not quite sure what to take along.

So we can assist in those areas as well. With financial negotiations too, we’ll sort of help the farmer there. Sometimes, they’ll be in a situation where they owe some money. I know I had one particular farmer who hadn’t paid his rates for three years, and he was too embarrassed to go to the local council to sort it out. But we went along, sorted it out with the council, put a payment plan in place, and then back to the farmer to, and we assisted that way. So we are quite happy to do the financial negotiations on their behalf in that particular case. So we’re putting out the spot fire by getting the rates paid, but then we’ll go back and ask what’s the underlying issue, why that occurred in the first place.

So we’ll sort of go back to them and actually try and work out well how did you get yourself in that situation and how can we do it better in the future? So we’ll help with those sort of things. We’ll do business plans too, we’ll help with setting up business plans. We’ll do a viability analysis of the financial situation as well. I know I had one particular farmer fairly recently, looking at his profit and loss statement, his expenses, his petrol expenses were 43% of the total cash flow. When looking at like-minded businesses, it should have been about 32%. So what he was doing is actually with all his work vehicles, he just put a petrol card in the glove box and then wasn’t sort of keeping an eye on each worker, each worker was just filling up their own car and so forth.

So we’ll just sort of point these sort of things out too as we go along, how we can assist. We also, if they sell on the farm planning, farm exit strategies, we’ll help them with a strategy there. And financial literacy too, so, we’ll also, a lot of the farms are excellent at farming, but not very good at looking after their financial matters. So we’ll sort of try and make them aware of their financial situation, let them know what they need to do and work out their break even points and things like that. So just to make it easier for the farmer. So this is just a little bit of a variety of the things we do. So we do a little bit of everything, but more and more clients that we’re seeing now.

We’re seeing client dealing with climate change a lot, a lot of climate change issues now. So it’s either flood or drought. And I know one particular farmer who backed onto the Liffey River, their family had been there for over a hundred years and he’d been there for more than 50 years. He’d never ever seen the river dry. And then a drought hit about three or four years ago, the river, there was wasn’t one drop of water coming down that river, so it’s never happened before. But the next, the very next year I was helping him do a flood grant, a $10,000 flood grant to fix up his roads because it was a major flood. So the other sort of things that the farmers are dealing with and services like us, around the country, they can sort of tap into and we can sort of assist them get through those issues.

So the great thing about the Rural Financial Counselling service, it’s a free confidential service. So it’s not going to cost the farm or anything for us to go and have a cup of coffee with them and try and be on their team. So those are the sort of things that we actually assist with. It’s not always easy when you’re a farmer and you’ve got to deal with all these different issues and things like that. So we are more than happy to go and help them with those issues. Also, when I was just talking about the situation there with dealing with drought, dealing with flood. So we’ll actually walk through with the farmer, we’ll ask a lot of questions, when we’re sitting there, just to make them aware of have they thought of various issues.

So I sort of tend to put it under four headings, whether it be monitoring, financial resilience, enterprise flexibility or trigger points. So I’ll go through and ask questions about each of those headings. So for example, under financial resilience, I might ask, do you know what’s the loan value ratio? Does your debt exceed two years’ worth of it? Gross income? Have you got enough liquid assets that would cover costs for one month, two months, three months, six months? So we’re asking all these questions to try and make the farmer aware to make their farm more resilient to both financial resilience and also climate change. They need to not just think about sitting on the tractor and plow, or you know, putting a crop in. They’ve also got to look deeper into it and make their farm to be more resilient.

They have to do it because it’s critical that they look at these issues. Because we are finding more and more it’s changing all the time. So that’s the sort of things that we do. We can sort of assist as a Rural Financial Counsellor. And like I said, we’re Australia wide. You can sort of tap into us anywhere around the country. It’s a free, confidential service. And look, most of the councils around the country have got a good financial background so the farmer can tap into their financial experiences in the past, for a free cost. So it’s not going to cost them anything. It’s just something they can actually tap into and it can make a huge difference. And like I said before, when I was running my farm I had no idea that our service existed because we can sort of make the farmer aware that there’s, because sometimes they’re so busy on the farm that there might be a grant that that’s available to them that they’re not aware of, or there might be a product or a Centrelink product that they can apply for that they’re not aware of.

Um, for example, the farm household allowance. So yeah, that’s how we can sort of help there Pip. So I’m not quite sure if you’ve got any questions for me, but that’s just running down a list of things we can do to help. It’s a variety of things. So fire away if you have a question.

Pip Courtney [00:16:13]:

Well, Roly, when you said that you didn’t know about this service when you had your farm, now that the service is there, do some farmers think there’s a stigma in ringing you and having an appointment?

Roly Chugg [00:16:27]:

Uh, yeah. Well I suppose there is a little bit of that in it. Yeah, that’s a good question because some farmers do sort of think that they’ve got the Rural Financial Counselling Service coming to my farm, and if the next door neighbour sees the car driving up the laneway, but we are sort of finding that is like probably five, six years ago or longer it was more that the stigma was there, but these days I’m not sort of coming across it as much now, so farmers are getting more and more happy to contact our service.

Pip Courtney [00:17:02]:

Maybe you need to put free in your title, Free Senior Rural Financial Counsellor. We have a question here from the Slido app from people watching at home. Roly, do you have any examples of an action a farmer has taken to be better prepared for risks?

Roly Chugg [00:17:20]:

I’ve got top probably a couple of quick examples that come to mind Pip. I know I had a dairy farmer who only had a small amount of acres. He had a 180 acre farm, and so it wasn’t a large farm, but he was running a dairy farm and he was leasing the neighbour’s 130 acres. So they only had about 310 acres, but every time it was a dry season, over the brow of the hill, there’s about 50 acres, it was pretty well like a desert, so he was losing on 50 acres every time it was a dry season. So we made him aware that there was a grant going for those farmers that were putting water troughs to paddocks. There was a 25% rebate the government at the time was giving.

So we made that farmer aware of that rebate, which was enough for him cause it was gonna cost him $20,000, so getting a $5,000 rebate was a lot of money to this particular farmer. So in the end, he ended up putting in 11 water troughs just over the brow of the hill. And it helped him maximise every acre that’s seen the dry season, he can still feed out and use that land just over the hill. So that’s one example in a sort of making his farm more resilient when it was a drought. I had another farmer too who got a creek, slash river that runs through his farm, and every year without fail, it always floods. So every year he was spending a fortune on fencing.

So we developed, we made him aware that there’s a particular fence he could buy that in flood, he can just lay it down and then it minimises the damage. So he put that fence in and it’s saved him a heap of money. So in flood, he could just lay the fence down once the flood was gone, he could just easily stand it back up again and just clip it into place. So just two little simple examples there Pip, where the farmers have made themselves more resilient. One, by taking advantage of a grant that was available at the time and just putting in these water troughs. And the other one was just by putting in a fence line that, come flood time, he could just lay it down very quickly. It only used to take about half hour, lay it down, you know, and like I said, without fail, it always flooded. And then each year had this large expense. So that was just two little examples where they could minimise costs, just by making the farm more resilient that way.

Pip Courtney [00:19:52]:

They’re great examples. Roly, thank you. When I come down and see Mum in Launceston next, I might pop over and you can sort my finances out.

Roly Chugg [00:19:59]:

Thank you so much for your time. I must say, you’ve been on my farm once, I was on Landline too. I think it was you that came to my farm. But anyway.

Pip Courtney [00:20:07]:

We do a lot Roly. Yeah, thanks for your time today. That was Roly Chugg, Senior Rural Financial Counsellor from Rural Business Tasmania. Often in the middle of drought, the needs of the business overtake the needs of the family. The Southern Queensland and Northern New South Wales Hub have developed the Family Farming Family Reboot program to help families improve critical decision making ahead of drought.

[Video voiceover begins]

Fran Thompson [00:21:01]:

We’ve been on this property now for 30 odd years, both passionate about living on the land. Our three daughters grew up in a lifestyle that I would encourage anyone to bring their children up in. During the drought, we never really experienced anything like it.

Grant Walterfang [00:21:21]:

For us here, it started in the mid, around 2015 and continued to get worse. We had some periods of rain, but it slowly started to bite and I think that’s what caught a lot of people out. Gradually the dams dried out, the grasses didn’t grow, people were hanging on for rain. They all said, it’s gonna rain one day. And I was thinking to myself one day, when’s one day gonna be, why aren’t we prepared? Why do we just go with this boom and bust?

Rhianne Dwyer [00:21:47]:

The drought was very, very hard on all farming families and a lot of people didn’t survive, you know, they had sold their businesses, they got out of farming. We obviously don’t wanna do that. We wanna have it forever and have it for our kids.

Lu Hogan [00:22:02]:

When we started our activities under the Innovation Hub and the Future Drought Fund, we wanted to make sure that we were meeting the needs of farmers in our region. And so we worked with our partners to find out what the gaps were in terms of services available to producers. And what we found was that there was plenty of technical information around about how to feed animals during a drought, how to manage during a drought, what infrastructure you might need. But what was really missing was that big picture overview about what’s the strategy for the business and improving their ability to plan and to think about the finances and to also look after themselves.

Fran Thompson [00:22:40]:

One day when I was at work, an email flicked up randomly onto my screen from the Future Drought Fund, and it gave an overview of this program. And at that point in time, I was feeling quite stale about the farm. We were thinking, well really, do we just sell? Our children are certainly, they’re very keen that we keep the farm.

John Warlters [00:23:05]:

So often in drought, the focus is on the livestock, it’s on the property, it’s on those immediate situations that are in front of a family. It’s the people side of drought that gets pushed to the side. Farming family Reboots is an initiative that we’re really proud of at Rural Aid and we feel it’s a really powerful thing to take families away from the farm for a brief period of time to come and get some new skills and some new knowledge and some new tools. And there’s a network of other producers who are here learning with them all united by that one big challenge that we’re trying to solve. And that’s how do you be better prepared for the next dry spell when it’s coming?

Lu Hogan [00:23:42]:

Each family will have its particular requirements. So some are up here to think about succession planning and goal setting. Some families come along because they’re finding that they’re diverging a bit in their goals and what they’re aspiring to achieve in the farming business. And so this is, you know, it’s the importance of getting away from the day-to-day grind and saying, what’s going on here? How can we sort this out in terms of our personal relationship, in terms of our business relationship? Because we all know farming is unique in the sense that we live together, work together, have our children on the farm. It’s everything’s so integrated and sometimes we need to untangle all of that a bit and set some new priorities and some new goals. Others are particularly here to wanna improve their pastures or to improve their grazing management skills.

Karen Weller [00:24:24]:

Succession planning’s always been something in the back of our mind for probably seven years now, but we just haven’t taken that step to work out what we wanna do. Our youngest son actually wants to follow in my husband’s footsteps and continue that legacy. So we want to be able to also provide something for our eldest son who isn’t into farming.

Rhianne Dwyer [00:24:47]:

I thought it’d be a great opportunity to reconnect as a family with my husband and my children to have a break from the farm and the work life, just from the daily stresses, but also to learn to hopefully better prepare our business for the next, you know, drought.

Fran Thompson [00:25:05]:

One of the greatest assets of the Family Farming Reboot that I found is the Ag 360 program. It is so user-friendly. It is a program that mapped your property. It gives you rainfall data, it gives you feed budgets, different types of soils.

Peter Weller [00:25:24]:

It’s so easy to use and it’s very relevant and it’s been made by people that understand agriculture, not just made by tech people. So I think it’s gonna be a very handy tool for the future. You gotta really run the numbers by it before you make up your decisions, what you’re gonna do. Because if the numbers don’t add up, well there’s no point in doing it just because you’ve always done it.

Jeffrey Dwyer [00:25:45]:

One of the things we learnt was just measuring grass to calculate how much we’ve actually got in a paddock. So you know when you can put stock back on or when you gotta take ‘em off looking after your plants, so they’ll look after you.

Grant Walterfang [00:25:58]:

So the presenters at the Drought Hub, I believe they really nailed it. Everything they taught us and showed us, they backed up with their own resources and their own experiments they’d done in the paddocks in the properties that they have around the Armidale University.

Fran Thompson [00:26:12]:

We could see how much research and development is going into farming, or agribusiness agriculture at the moment. And that was something that blew me away.

John Warlters [00:26:25]:

The beauty of the Farming Family Reboot Program is it’s not anchored to any one location. It can be picked up and taken right around the country.

Lu Hogan [00:26:33]:

And we are starting to get inquiries from across Australia as to whether it could be run in that region.

Fran Thompson [00:26:38]:

Strategic planning, business planning, that is something that you do at night time when you’re really tired and it’s like, well, we’ll put that away for tomorrow and tomorrow never comes. So it was a great opportunity to just refocus.

Steve Thompson [00:26:52]:

I’m not into going away to courses traditionally, I’m better off spending time here. I thought the program was fantastic. It’s just not about farming, it’s about the whole lifestyle.

Jeffrey Dwyer [00:27:07]:

You can never stop learning, I mean, there’s different ways of doing things now. Can’t change the weather, but we can do other things to help. I just come with an open mind. We can go home and maybe try different things or prepare better for it if it does come dry again.

Karen Weller [00:27:26]:

What I found at the program, which was so different to other programs during the drought, was the mental health component. There was a lot more positivity and a lot more explanation, and I took so much more away.

Grant Walterfang [00:27:45]:

Too often, we think we know everything or we think we’re on the right track, but we’re not open to new ideas. People get up at five and they just get out there and they do what they’ve gotta do and it becomes a chore. But that’s not what it’s about. It has to be about we can beat all this, we can do this.

Grant Walterfang [00:28:04]:

The renewed enthusiasm I got from this course has been the difference for me. Everybody got something out of it, even though there were people there that ran gates, people ran sheep, people ran cattle people in different areas. Everybody was facing the same issues. Just to see all the enthusiasm and to see how they all faced the, the most terrible time of their life, which was that last drought and the way they got through it and the fact that they got through it and they were still going and they were looking for answers and looking for ways to mitigate that just put me in the right direction. And my wife and I, we have this renewed vigour. You’re gonna be able to ride out the next drought and adapt our business to it.

[Video voiceover ends]

Pip Courtney [00:28:46]:

That was Grant Walterfang from Springdale Cottage Pastoral, just outside Stanthorpe on the Queensland New South Wales border on the impact of the Southern Queensland and Northern New South Wales Hub’s Farming Family Reboot Program. Now to another way of improving the odds for farming profitability. Kerry Battersby from Queensland Farmers’ Federation is here with a presentation about how farmers are protecting their farm income through weather risk management tools such as parametric crop insurance. Over to you Kerry.

Kerry Battersby [00:29:19]:

Thank you so much Pip. Look, there’s some great stories this morning in this session. I’m so pleased to be part of it. For those of you who don’t know, Queensland Farmers Federation is the united voice of intensive and irrigated agriculture in Queensland. QFF is a federation of peak and national industry bodies, and together we represent around 13,000 Queensland farmers. So that’s a lot of representation. Last year at the Science to Practice Forum, we spoke about the concept of parametric index crop insurance. Now that’s a mouthful. QFF is working with its partners, university of Southern Queensland International Insurance Brokers, Willis Towers Watson and Celsius Pro on a project funded by the Australian Government’s Future Drought Fund. Today we’ll give you a brief update on the project and share some of the priority themes that are emerging from this work.

But I expect this session may indeed raise more questions than answers. Next slide please. Firstly, let’s recap what is parametrics? Parametric, or climate index insurance, is just one financial instrument that can be applied to farm businesses to provide a buffer or a hedge on weather related losses. And hopefully it minimises risks and smooths income volatility for the farmer. Parametric index insurance pays the business a pre-contracted amount when a certain trigger on a weather index is realised, such as in drought below a certain rainfall percentile where you’re in drought so you can get a payout and draft a policy for that situation. QFF has determined that risk transfer mechanisms such as parametric insurance may indeed enable farming businesses and their communities to mitigate the risks of production loss, income loss, and business discontinuity. Next slide please. But let’s acknowledge the complexity of decisions that farmers need to make to manage risks, threats and hazards.

This morning we’ve heard from Michael Taylor, a wonderful sixth-generation farmer who’s just, you know, kicking goals all over the place. Farmers are proactive. We plan and design for a successful planting season and account for numerous variables and identify risks and threats in business. We all know what those are. Weather variability that can include extreme dry periods, excess rainfall, hail or cyclones. In addition to the business compliance, the client contracts, the supply chain issues, natural resource management, staff shortages, and security compliance. These are all risk management decisions that must align and be designed to achieve a stable income stream and a profitable farm business. One of the challenges of managing the discontinuity caused by a weather event is evident during the early response phase. So you’ve been through the event and then in the first few hours following impact. We often don’t know the full extent of damage or the cost to restore business operations on initial site inspection damage might be downplayed as effects are not immediately obvious, but they become evident as time from the impact moves on during this initial response and recovery period.

Much of the anxiety is the unknown and most of the stress is financial, assessing the financial losses to crop, plus managing staff expectations and the stress and burden of continuing to pay wages when you are unproductive. So we have a business discontinuity issue and unknown factors impacting recovery time objectives, and access to resources. Next slide please. So in this initial recovery phase, the beauty of a parametric index insurance solution is twofold. Firstly, there is a prompt payout, usually within 14 days after the impact has been confirmed by the insurance company and they base that decision on BoM data and any data from on-farm weather stations that are endorsed by the insurer. There is no need for a loss assessor, nor is there time delay, nor in instructions from insurers about cleaning up and throwing out debris. If the event parameters trigger, the farmer receives the payout, it’s a contract.

The second benefit of parametric crop insurance, you predetermine the payout and what this is used for. So if you know that after a flood event, not only is crop affected by inundation, but the crop can experience post-event pestilence, fungal infections, plant saturation, or indeed sunburn, the result is a compounding degree of crop damage. These losses don’t have to be proven or qualified to the insurance company. Hopefully with your experience of the farm, you have built in an amount to cover the losses that occur in the weeks after a flood event from the pest and disease. The financial payout can be used for anything for recovery. There is no qualification needed by government agencies as eligible activities. Yes, you can pay your normal wages bill if you have calculated this into your payout. You know, that’s the biggest light bulb moment for farmers. When we describe the benefits of parametric crop insurance, I can build into my payout any secondary crop losses, or I can use the funds to pay my normal staff wages.

This takes away much of the pain and the financial burden farmers experience in this initial recovery phase. We’ve used flood as an example here, but the same contract and terms can be applied to an expected low rainfall season where say, a predetermined low soil moisture index may be the trigger or the parameter. Next slide please. Let’s look at our second theme, self-reliance. If we take a systems approach to the theme of self-reliance, we need to ask what extent can we build or embed self-reliance into existing farm data systems, processes and practices to enable farmers to smooth income volatility? We are big advocates for embedding business continuity strategies into farm business practice. When you look at the daily activities of agriculture, there are similarities to manufacturing where business continuity is already heavily embedded. These are both process-driven, but of course we have very different products.

Sometimes our products blink at you before going to slaughter. Other products like pineapples offer a sweet reprieve from summer heat. The process of embedding continuity practices into routine sound simple and straightforward, but it’s not achieving. Self-reliance can be complex. It takes a long time to embed practices and business owners need to envision the improvements to recovery time processes. And it’s gotta make sense to the bottom line. Crop insurance is a business operational cost, not an investment, but let’s put it out there as well. If farmers are more self-reliant through the uptake of parametric insurance products, what is the role of government to support producers who do act proactively prepare for the poor seasons? What is the role of government? Next slide please. Our third theme in this project is really looking at innovation. And innovation is critical in this area as both technology and data evolve.

One of the challenges that has been in has been to ensure the accuracy of data from the local BoM weather station, for instance, which may be 20 kilometres away from your farm location. Some data sets, such as temperature, have a very high level of accuracy, but others such as hail have very little. So let’s talk about hail. The hailstorm example is interesting. Over the last few years, hail crop insurance has been slowly removed from the traditional indemnity insurance package. Growers that have had hail insurance for 30 years open up their renewals to find the premium has increased, but the hail cover is no longer offered. So in this project, QFF is looking at hail insurance specifically for intensive horticulture crops such as pineapples, custard apples, avocados, and other tree crops. Hailstorms are very hit and miss. They can cause catastrophic damage to one property, while missing a neighbouring property.

While the impact may be small in terms of geographic spread, hailstorms can wipe out a farmer’s income for 12 months, which is what we saw in the Valentine’s Day hailstorms in Stanthorpe in Queensland. Damage from hailstorms is generally not eligible for government funded natural disaster assistance grants, due to the relatively small geographic footprint of impact. BoM can tell us there was a severe storm cell in the area, but it is difficult to know the size and intensity of the hailstones themselves. So, by pairing BoM data about the location of severe convective storm cells with reliable and verifiable on-farm data and new technology, as we are using with the Hailios eyewitness system, we can record the size and intensity of the hailstones, allowing Hailios and our insurance partners to structure robust, accurate, and innovative parametric products for hail. Historically, if a farmer knows that the worst hailstorms include small hailstones, say less than two centimetres with high intensity, and generally they last for about five to 10 minutes, then these factors or parameters can be customised to build a parametric hail insurance cover. If that specific event occurs, you receive a payout. Next slide, please.

If you like to have a bet on horses, you’ll get this analogy. While nothing in life is very certain, there are things that we can do to improve our odds. Think about a smart punter. A smart punter will study the form guide, know the trainer’s history, assess the jockey’s performance, and find out the horse’s current fitness. It is an informed decision if the horse you bet on wins the race, you receive a payout, happy days. These days, betting options can be customised to offer a punter a double bet, an each way bet, quad same race, multi bet, and a plethora of options. I’m sure you’ve all seen the advertisements. Okay, are we comparing insurance to betting? Yes and no. We’re talking about the skill of making informed decisions and seeing insurance as a cost of business, not a punt and not an investment. The options available to farmers through innovation data and technology can help to smooth out income volatility.

When farmers make decisions about their on-farm income and profitability, they consider all variables and obtain professional advice because they want success. They want to back a winner, they want to back themselves, their farm business. Next slide please. So in summary, with research technology, innovation and international data sources available from our insurance partners, Willis Towers Watson and Celsius Pro, we can manage discontinuity, build self-reliance, apply technology, and improve the odds for farmers to smooth income volatility. These solutions are new and complex, but agile and adaptive for farm sites who are vulnerable to high-risk weather events and droughts. So Pip, I hope that provides some insight into the work that QFF is doing at the moment with its partners. I’ll hand back to you for any questions.

Pip Courtney [00:41:48]:

Kerry, that was a fascinating presentation and we have quite a lot of questions coming in on Slido. The first one is, farmers often talk about bad experiences with insurance companies. Is this a barrier to uptake of these new solutions?

Kerry Battersby [00:42:04]:

I think the bad experience we have to acknowledge, that I think government, insurance and farmers need to acknowledge is that there have been bad experiences and that’s why it’s important that we have a new design for crop insurance. The perceived premium costs were high, really bad experiences potentially with assessors and post-event non-payouts, but let’s put that to the past because there are new solutions now and that’s really important for us and for farmers.

Pip Courtney [00:42:36]:

Well, you had me at no loss assessors and instant payout, I reckon a lot of farmers’ ears would’ve pricked up then. Is this the same as multi-peril crop insurance? Is it a new name for it? Like, can you explain parametric and what that means?

Kerry Battersby [00:42:51]:

Parametric, yeah, it is different. The parameter, it’s easier explained as a cyclone example. So if you have in a location, say between Mackay and Cairns on the coast, and you can experience regularly a category three to five cyclone, you know, it’s coming through and the Bureau of Meteorology gives you warning that you are in that cyclone zone, you can set a parameter around your farm. So you could set a radius of say, 50 kilometres around your farm. If a category five cyclone impacts that 50 kilometre radius, whatever payout you’ve nominated in the prior contract with the insurance firm you receive if that cyclone impacts within that 50 kilometres. So it’s customised to your farm site, it’s customised to your key risks.

Pip Courtney [00:43:47]:

What are the premiums like? That’s another question that’s come in from Slido. Are the insurance products here more affordable?

Kerry Battersby [00:43:56]:

Affordability is relative. I think farmers need to see this as a cost, not an investment. So it’s a cost of ensuring that you can continue production, continue supply and continue in business. So that needs to be acknowledged. Profit, profitability is important, therefore the cost of that depends on where you’re located, depends what risks, and you can customise it. So you might start with the Rolls Royce version, but you might prefer, you know, the Land Cruiser version, which you know, is slightly tailored to your risk and to your needs post-events so that you have funding available, as we said, to pay staff wages and also to help mitigate any secondary crop losses.

Pip Courtney [00:44:46]:

Kerry, thank you very much. I’m sure it’s sparking a lot of conversations around kitchen tables in farmhouses. Thank you so much. That was Kerry Battersby, Project Manager from the Queensland Farmers’ Federation. I hope you’re enjoying the presentations on day two of the Science to Practice Forum. We get a break for lunch in about half an hour. Next up is Glenn Briggs from Aglytica, an Australian owned and developed software business with roots in agricultural data offering business benchmarking along with budget and cash flow forecasting. It recently received Innovation Grant funding from the Southwest WA Drought Hub, in conjunction with the Grower Group Alliance, which has helped inform their greenhouse gas emission calculator for broad acre cropping in sheep and beef enterprises. Here to tell you more is Glenn Briggs.

Glenn Briggs [00:45:40]:

Thank you very much Pip. A great pleasure to be here presenting amongst peers and industry leaders alike, as Pip mentioned. So we are here to discuss the importance of a baseline carbon emission audit for farm businesses today. This project has been ongoing for Aglytica for a little bit of time, but was recently turbocharged through a Southwest WA Drought Innovation Hub grant, to add some, I guess, some more meat to the bones of what we’ve been developing over some time within Aglytica. So you might ask me why, you know, what, what’s the importance or why are we, you know, looking at a carbon audit? And effectively what happened is that the current incumbent government signed up to the Paris Accord commitments, which sees Australia committed to reducing carbon equivalent emissions across all industries and across the whole of Australia by 43% on the 2005 numbers by 2030.

So that’s not too far away. And it’s, you know, it’s approaching rather quickly. Then further than that, by 2050, Australia should have or will have net emissions of zero when it comes to CO2 equivalent gases. So our view on that is you can only move what you can measure. So unless you know what you’ve got, unless you know what you’re looking at, how can you make any difference and report on those differences. So that’s why it matters. What are the tools for measurement in agriculture? So there’s three accredited tools within agriculture to measure farm businesses’ CO2 emissions, or CO2 equivalent gas emissions. One being the PICCC Farm Print, which is a CSIRO development and Cool Farm Tools, which was an initiative by industry in the northern hemisphere. So a whole heap of big businesses got together to create a northern hemisphere tool, which has been adapted to our particular hemisphere.

What does it look like? Enough baseline audit from PICCC, which is the preferred calculator of Aglytica, outputs look like this. So it’s a number. Why does it matter? What does it look like? How do I interpret it? You’re not gonna get back this type of information.

This number, in the first column there, [inaudible], this is moving as we [inaudible] 2030 and the net 43% reduction and 2050, which is net zero. So there’s a requirement for big businesses, with turnover around about a hundred million or more to report their CO2 gas emissions. So that’s gonna fall back downstream pretty soon after. So that’s what a carbon emissions audit looks like on a typical farm business there.

So we feel that you need to go deep on the breakup. So you need to understand what those numbers on the previous slide, so what these numbers here, what they actually mean, and how you can impact them for your particular farm business. So again, you can only move what you can measure. Now, what this chart is displaying is effectively that around about 50% of all CO2 equivalent gases produced on farm are produced by inputs. So that would be nitrogenous fertilisers, lime, urea, those types of implements that are used to, particularly in broadacre cropping and grazing to produce bigger, better, stronger crops. Around about 50% of all gases are attributed to those. Around about 30%, give or take of the CO2 emission equivalents are produced by crop residues or treatment thereof. So that’s the stubble, which is either burnt or left or harvested in another way. And around about 15% of all emissions are attributed to fuel, so diesel and so forth in machinery.

So again, we really feel it’s important to understand your numbers. So through the Southwest Drought Hub Innovation grant, what we’ve been able to do is firstly conduct baseline carbon audit using the PICCC or the Melbourne University Greenhouse Accounting Framework, which is in behind that. We’ve used that tool to create carbon emissions for farm businesses and then put that against some production and some yield numbers to make sure that we can get a good understanding of what’s driving the CO2 and what it looks like. So by understanding your numbers, you can tell a much clearer story. So if you have a look at the wheat chart on the left hand side there, it’s the most easy to explain the blue bars. There are the CO2 equivalent gases on a per hectare basis. Down the bottom we have low, medium, and high rainfall zones.

So that’s attributed to each of the gases. So about 1600 kilos per hectare on a high rainfall zone, down to just about half of that in a low rainfall zone, if we’re just purely looking at CO2 equivalent gases per hectare. When we map that to the yield of those businesses, we can see that we’ve flattened off that little tower, which is heading up that way. When we look at it on a per hectare basis, when we understand our numbers and we can talk to how we apply the numbers within the business, we can see that that number flattens out. So they’re all at around about the high 300, between 360 and three 80 kilograms per ton of grain produced in wheat. And that’s a fairly similar story across most of the broadacre cropping that we benchmark and the data that we hold within our data set, which again, has been mapped against carbon through the Southwest WA Drought Hub Innovation grant. So knowing your numbers allows you to tell a much truer story. Because if you look at looking at the tons per hectare, you’d think that a high rainfall zone is not necessarily a good place to farm from a CO2 gas emissions perspective. However, when you put that to the higher yield, it tells a much different story.

So look, in summary, what we are looking to do is just get ahead of the curve effectively. So it’s important to know your baseline number and then put that number against all your other numbers so you have a good understanding. So conduct a baseline and then conduct regular carbon audits of your farm business. It’s critical that you understand what your numbers are, how they’re constructed, and what happens with those numbers afterwards. The volume of emissions that are generated by a farm business can be influenced by management decisions. So things such as precision agronomy for the application of fertilisers and pesticides and herbicides. A allowing you to topically apply those particular agents, rather than spreading a whole paddock with those that not only reduces cost in the business, but also reduces the impact of those particular inputs on a business.

Simple things like ensuring that machinery is well kept and well maintained, that good quality products are used in the maintenance of those particular pieces of machinery used within agriculture that the machinery is fit for purpose so you’re not underpowering vehicles which are then forced to work much harder to conduct farm business. One of the things which was really interesting that we discovered by mapping carbon to many different metrics that we measure within our database, was that lowering carbon emissions or carbon equivalent gases doesn’t necessarily mean that there’ll be a negative impact to that particular farm business. So what it shows is that our top five farming business enterprises from a CO2 equivalent perspective, were actually in the top 20% of the most profitable farms that we benchmark across about 300 farms and growing.

So a green or a sustainable business or a lower emission business doesn’t necessarily mean it’s a costly business to run. And we’ll see more of that play out of over time some small steps that you can make while you’re managing your business. So as I mentioned before, you know, matching machinery to use, proper maintenance, good quality fuels, oils and lubricants, precision economy, all these things, all these small little things can make a fairly significant impact to your farm’s CO2 gas emissions. And most critically I feel for agriculture. A study to attribute around about 14% of all CO2 equivalent gases in Australia, give or take. It’s important that we as agricultural businesses and agricultural producers and farmers are able to lead the discussion from a place of deep knowledge of your business.

So if we go back to that wheat slide and we look purely on a tons per hectare basis, if you’re in a high rainfall zone, someone would say, that’s horrible because I’ve seen farms that are 800 or half of that. But when we put that against yield, and you can have that deep knowledgeable conversation around what your CO2 equivalent gases are in your business, it will change the parameter of that discussion and allow you to lead the discussion for agriculture from a place of deep knowledge. So they’re really the main summaries that we’d like to provide in the short time we’ve been gratefully provided today to present to you all. And yeah, that sort of brings me to a conclusion. If there’s any questions Pip, that’d be great.

Pip Courtney [00:55:45]:

Thank you, Glenn. That was a comprehensive rundown there. So we’ve got time for one quick question that’s coming in on Slido. What’s the easiest and cheapest way I can reduce my farming carbon emissions, I suppose, what’s the low hanging fruit?

Glenn Briggs [00:55:59]:

The lower hanging fruit, it’s those management decisions. So unfortunately the inputs that we use in farming today are very heavily manmade inputs, and they do produce a fairly heavy greenhouse gas emission footprint. The application of those through things such as precision agronomy or the things that I mentioned around, you know, matching farm equipment to machinery, those type of things are the things where you can generate small wins which turn into big wins. So it’ll have a good impact on your bottom line because you’re using things more effectively, but it’ll also have a great impact on your sustainability or your CO2 equivalent emissions on your business. So really look at the management practices within your farming business. Make sure you’re maintaining your gear really well, thoroughly matching gear to usage and keeping an eye on those. But those numbers are critical. So continual audits even if your CO2 equivalents aren’t decreasing, but your yield is decreasing, increasing, sorry, that’s a good story to tell. So it’s about knowing the numbers and making those small changes in your farm management practice.

Pip Courtney [00:57:04]:

Thank you, Glenn. I’m gonna use your line, deep farm knowledge. I’m gonna use that in the future. I hope you don’t mind. Thank you for a great talk. That was Glenn Briggs, the National Vision Business Development Manager at Aglytica. It’s time for one more presentation now before lunch on the benefits of Natural Capital Accounting. Dr. Daniel Mendham is a Principal Research Scientist and leader of the Landscape and Forest Function team at the CSIRO. He’s based in Canberra but works on agroforestry systems across Southern Australia. Daniel leads the Perennial Prosperity Smart Farming Project, which aims to understand, quantify, and account for the multiple benefits trees bring to ag systems. He believes farm productivity and resilience can be substantially improved by the integration of the right trees in the right places, and that that can lift farm profitability, increased production of food, fibre and energy, while improving environmental outcomes. He’s presenting his key findings from his work for us today. Over to you, Daniel.

Daniel Mendham [00:58:14]:

Great, thanks a lot Pip, appreciate the introduction and thanks to the organisers for inviting me to present. I’m gonna talk to you today about, if we get the presentation up, about the Perennial Prosperity Project that we’ve been running for the last few years. Growing Success is the title of the talk, and we are developing Natural Capital Accounting to understand what value trees have to farms and farming enterprises. I’d like to acknowledge the partners in the project. So Private Forest Tasmania, Greening Australia, University of Tasmania, the MLA, and of course, the funding organisation, DAFF, through the Smart Farms: Small Grants program.

Daniel Mendham [00:59:08]:

So, I’m going to explain what Natural Capital is because, when you say Natural Capital, it’s a bit of a buzzword, but a bit hard to understand what it actually means in some places, in some cases. But it is actually quite simple and farmers do know what it is. They just don’t use the term often. But farm Natural Capital is the soils, air, water, rocks, and all the living organisms on that farm. And that Natural Capital provides ecosystem services that effectively support our economy, and on farms, that’s crop and livestock production primarily. And we are taking a different approach. We are saying financial balance sheets are typically the main driver of on-farm decisions. So farmers look at whether a land use decision is gonna return money, but that doesn’t tell us what’s happening to the Natural Capital. And in many cases, the Natural Capital is down, or the farm is not sustainable. So what we’re doing is we are taking a step back and saying we can look at the Natural Capital, we can look at what’s gonna happen to the Natural Capital, and we can understand and quantify those flows of ecosystem services that it is providing. And we can see whether that farm Natural Capital balance sheet is improving or [inaudible], that’ll tell us about the sustainability direction.

So my particular interest is in trees and how trees can improve Natural Capital and improve drought resilience. And we heard a really inspiring presentation from Michael Taylor, the 2022 Farmer of the year, about the value of trees on his farm. And I can’t say it any better than Michael, but planting the right trees in the right place can really improve farm enterprise resilience, sustainability, and profitability. And there’s a wide range of benefits that trees can provide, but we’re quantifying and then demonstrating the value that trees bring for shade and shelter for crops and livestock, the diversity of income that trees can bring, the potential to bring in biodiversity and biodiversity habitat and the carbon and water benefits that trees can bring. And by putting all of these into a single set of farm Natural Capital accounts that we are developing and testing.

So I’ll just run through these very quickly. It’s not often acknowledged, but agricultural productivity can be markedly improved by planting shelter. And on the map on the right-hand side of my slide here, we can see that, you know, 25 hectare paddock in, in Cressy in northern Tasmania. On the sheltered, Western half of the paddock, there’s 30% more pasture than there is on the unsheltered Eastern half. And that’s because those trees are providing that ecosystem service to the agricultural side of the enterprise, as well as productivity. There’s biodiversity and biodiversity comes in many different forms. There’s obviously carbon and forest products, so people think of those two as being maybe the key outcomes from planting trees, but they’re not. There’s pollination and there’s water.

I’m gonna dip into a few of these, particularly agricultural production. So that map that I just showed you, you don’t need to look at the graph too closely other than to understand that the biggest returns from those plantings those belted trees are actually on the agricultural enterprise. So the shoulder benefits to agriculture or the total benefits were about $54,000, but the shelter benefits to agriculture were most of that, $42,000. So 80% of the value of the trees came from those shelter benefits. And with smaller numbers for harvest from the trees, from carbon sequestration and from amenity or land value increases. And planting of those trees was about $6,000. But the internal rate of return on those trees is about 19%. Once you account for all the benefits, we’re gonna look at farm dams, and shelter can make a big difference to farm dams.

Dams. So this is particularly important during the dry, but also in the wet. This farm dam is at a place called Nile in Northern Tasmania. The shape and size of the farm dam is similar to that paddock I showed you, and we’ve got evaporation measurements at that paddock tell us that this farm is likely to be saving about 30 megalitres of water evaporation from that dam for every year. So those trees on the north-western edge are basically paying for themselves every year. Biodiversity. So biodiversity is a critical public good that farmers are often not recognised for, but they do provide a lot of good habitat. And by planting new trees on farms, they can actually increase that biodiversity habitat. And we are developing models that can really help to simplify and more readily assess the biodiversity values of new trees on farms. We are looking at improving habitat condition and improving the habitat for critical and vulnerable species, threatened species.

The next slide. And then integrating these into a set of Natural Capital accounts. So Natural Capital Accounting is a way to bring sustainability to the funded enterprise balance sheet. It’s one way. One good thing about Natural Capital is you don’t have to use dollars. You can use whatever units are most appropriate and that may or may not be dollars. And the key thing from my perspective is that planting trees is a way to improve farm Natural Capital. And if you look at the maps on the right hand side, we’ve got one farm that we’ve mapped the Natural Capital assets at, in the top picture. And then on the bottom picture, there’s a map of the impact that those trees are potentially having on the agricultural side of the enterprise. So there’s the sheltered areas from those trees. So obviously there’s some nice green areas, but if we plant more trees, we can get more of those green areas.

And this is an example, a very simple example of how these accounts might look. So you can, for each Natural Capital asset, so that might be a shelter belt or it might be a paddock tree, you can look at the shelter benefits, the carbon benefits, the wood products, the biodiversity, the pollination. You can look at the potential that that asset might have. So in the case of shelter, it’s say $1,500 dollars per hectare per year to the agricultural side. And then you can look at what happens both at planting, so at planting it’s gonna be a cost because they’re gonna take up space, an opportunity cost. But as you go year one, year two, year three, we can map those returns to the farmer.

So in conclusion, farmers are actually pretty well aware of the Natural Capital benefits that trees bring, but our Natural Capital Accounting is helping to make those benefits transparent and quantifying them. And so we think that’s important for changing behaviour. So if you know that those trees are gonna bring those benefits and you can demonstrate it to your customers and your, maybe your farm financers, then that really helps to improve the transparency of those benefits. Natural Capital Accounting can do that for you. But it’s a developing field, so it’s something that’s very new. It’s captured a lot of interest and is a good way to integrate those benefits. But we are still early days yet, and I think this project is actually forging a pathway as to how we might do this going forward. So we’re getting there. I’ll hand back to you Pip.

Pip Courtney [01:07:45]:

Thanks, Daniel. It’s really interesting that we’ve heard some complex and new information, carbon accounting, new types of insurance, but you and Michael, our Farmer of the Year, talked about something so basic, shelter and what farmers can get from it. Why do you think people are forgetting about the benefits of shelter?

Daniel Mendham [01:08:07]:

Look, I don’t think they’ve forgotten about it, but they don’t have, farmers don’t have a framework that they can fit the benefits into. And in that example I showed you at Cressy, if you plant one hectare of trees, you’ve taken one hectare out of production, that’s not a good thing. Then you take another hectare of the competition zone. But if you look further out into the paddock where there’s, you know, up to 50% more production depending on the distance away from the trees, that bit’s harder to quantify. And it’s not until we do enough, we go in and measure them and actually make it clear, that farmers start to click, that is what they’re seeing and that is their experience. And then having a metric or a way to integrate that into a Natural Capital account, I think is a very positive way to look at how they, what value those trees are bringing. So instead of thinking that trees might be giving you a return, maybe when you harvest them, or, you know, when they get big 10 or 15 or 25 years later, they’re actually starting to provide a return to the farmer within three or four or five years. And in fact, they become a net positive on the financial balance sheet within three or four or five years.

Pip Courtney [01:09:27]:

And Daniel, we have a question from Slido. How do you get past the barrier of people switching off when they hear the term Natural Capital Accounting?

Daniel Mendham [01:09:37]:

Ah, look, that’s a good point, and I completely understand that Natural Capital Accounting is a difficult term, but it’s something that’s coming. There’s a lot of interest in it from government, from banks, and I think it’ll become normalised once people understand that it’s not that scary, but that it can actually be a benefit to farm businesses.

Pip Courtney [01:10:06]:

Thank you Daniel. It was a great message there on planting the right trees in the right places. Thanks to Dr. Daniel Mendham at the CSIRO. That concludes the morning portion of the program on Day 2 here at the Future Drought Fund Science to Practice Forum. Join us at one o’clock after some lunch to hear some of the lived experiences and lessons learned from those who’ve farmed through drought and hear what they’re doing differently. You’ll also meet today’s panel guests. I can’t wait for this one. A group of young agfluencers, a new generation of farmers using social media to talk to a wider audience about Australian agriculture. See you shortly.

[Recording ends]

**Acknowledgement of Country**

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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