# Science to Practice Forum

## Day 3 Part 1 Program Transcript

**1 July 2021**

### Introduction

This event connected researchers, farmers, agribusinesses, communities and governments todiscuss practical opportunities and strategic challenges in building drought resilience across Australia. The Forum brought together for the first-time the eight new Drought Resilience Adoption and Innovation Hubs who presented their region’s co-design priorities and how they plan to address these issues over the next four years. There were opportunities to learn about the other Future Drought Fund programs, other national programs and initiatives such as the National Agricultural Innovation Agenda and contribute to the Research and Adoption Investment Plan.

### Transcript

[Event begins]

Andrew Bell:

Good morning, it's eight o'clock in the West, half past nine in the Centre and 10 o'clock on the East Coast. Welcome to day three of the Future Drought Fund Science to Practice Forum. I'm Andrew Bell, I'm hosting from our Central Studio here in Canberra. We know you're watching right around the country on this 1st of July 2021. Before we go any further, I'd like to acknowledge that this studio sits on Ngunnawal land, the traditional custodians of the land in the Canberra region. We acknowledge elders past, present and emerging, and our attendees at this forum, hundreds of you, you're attending on many lands, and we'd like to acknowledge those lands as well.

Andrew Bell:

Well, it's day three and it's going to be quite different to days two and days one, and if you'd like to tell us if you've been with us all the way through or just for today, have a look at the poll that's running today on the hopin platform. We're going to be going live for the next hour and a half here in the studio. We are following COVID guidelines. Rest assured masks are being worn behind the scenes, we're wiping down chairs and all the things we need to do to keep ourselves as safe as possible.

Andrew Bell:

We're going to start with four live presentations and it's my great pleasure to kick off this morning by welcoming Joanna Stanion, who's First Assistant Secretary of Agricultural Policy at DAWE with the Department of Agriculture, Water and Environment. Jo, welcome to us and start us off on day three, please.

Joanna Stanion:

Thanks, Andrew, it's great to be here with you today, so thank you for the opportunity to open the final day of your first annual Science to Practice Innovation Forum. So, the forum has brought together a wide range of voices to build the Foundation of Drought Resilience in our regions and it's been really fantastic to hear from some really interesting speakers over the past two days, and to hear from the drought and innovation hubs about their plans going forward. And we'll have the final two, Victoria and South Australia, today. And it's been great talking to the team about their level of engagement that all of you have had and the discussions that have been going on during all the presentations and the panel sessions. It's really exciting three days for you.

Joanna Stanion:

So, we know that drought is an enduring feature of the Australian landscape and the significant economic, environmental and social impacts it has on farmers, communities and the landscape. That's why it's great to see the establishment of the eight drought hubs and the benefits of bringing together researchers, primary producers and community groups to enhance drought resilient practices. So, we'll look forward to hearing and seeing how the drought hubs grow over the years and become flagship precincts for agricultural innovation, ensuring research is accessible, it's making a difference on the ground to farmers and it's increasing opportunities for commercialisation of innovation.

Joanna Stanion:

And the first session this morning that I'm opening is connection to national priorities. And this session is a great opportunity to hear about some of the other key initiatives that the department is undertaking to support the growth of a resilient, sustainable and productive agriculture sector. In particular, you'll hear from my colleagues who will discuss the national soil strategy, the agricultural stewardship package and the national agricultural innovation agenda. But first, let me briefly provide some context on these initiatives and an overview of some of the key priorities for the department in the coming year.

Joanna Stanion:

Since industry announced its goal to become a $100 billion industry by 2030, the government has been laying the foundations for farmers, fishers and foresters to take advantage of opportunities and be rewarded for their efforts. The government has reformed national policy settings and frameworks and directed substantial funding to new initiatives to better support industry like the Future Drought Fund and the drought hubs. And the department is committed to looking at areas where more needs to be done and to listen to what industry tells us it needs.

Joanna Stanion:

Despite the challenges of 2020, including bush fires, drought, COVID-19 and trade disruptions, the agriculture sector remains strong. It's one of the only industries to grow in value. The recent ABS figures have indicated that the value of farm production is forecast to be a record $66.3 billion this financial year. But despite consistent growth, reaching that target of $100 billion is very ambitious and will only be possible if industry is successful in harnessing emerging opportunities and increasing efficiencies. And in this year's budget, the Australian Government announced a significant package of measures with work to support industry to reach this 2030 goal across seven themes.

Joanna Stanion:

So, you'll probably all be very familiar with these themes, but I'll just go through them briefly. So, the first one is trade and exports. So we're working with industry to strengthen agricultural ties with major and emerging markets and making it easier to do business. And this is intended to deliver new market access for producers while also reducing red tape. Over $400 million is being invested in our biosecurity system to continue to protect us from diseases and pests and maintain our clean and green reputation internationally, which really sets us apart. We're ensuring Australian farmers are rewarded for their stewardship of land and water, and the government's committed over $246 million to expand support for stewardship and create market opportunities for farmers who improve bio diversity, including through improved management of soils, which you'll hear about from Troy.

Joanna Stanion:

So the national soil strategy and the investment in that strategy is a landmark moment for soil health in Australia. Fair, strong, and resilient supply chains are also critical. And this year's budget invests in perishable agricultural goods industries, to put in place frameworks so that all producers are treated fairly throughout the supply chain. Water and infrastructure, obviously also very important and the government is supporting farmers and rural and regional communities with infrastructure where and when it's needed.

Joanna Stanion:

Christine Mulhearn will talk to you about innovation today. The innovation system is integral to reaching this $100 billion target and our four national priorities were announced in the budget this year, which are focused on exports, climate resilience, bio security and digital. And the roadmap for building an agricultural workforce of the future sets out three themes, attracting, skilling and realising the potential of the workforce. We really need to make sure that we've got the people to do the jobs of the future, a lot of which haven't even been created yet, but we need to attract more people into agriculture. And we know that over the last 18 months, there's been a lot of challenges as our borders have been closed, so it's been difficult to bring in expertise from outside Australia and to move people around the country at the same time, so we need to do more.

Joanna Stanion:

So, you can see we've got a big 12 months ahead of us, but the future is looking good. Success will require a sustained collaborative effort across industry, government, research organisations, producers and communities to make sure the foundations are in place and industry has the best chance possible to achieve its goal. So, before moving on to our first speaker of the session and handing back to Andrew, I'll just remind everyone that you're able to contribute to the Research and Adoption Investment Plan that was discussed on day one. The plan will help identify our highest national drought resilience investment priorities. We're collecting your feedback on the investment plan by via the hopin chat, so I encourage you to post your ideas in the chat as they come to you and use the hashtag investment plan, so we don't miss your feedback. So thank you for having me here today. Thank you, Andrew. I hope you enjoy the rest of the day and in particular, this session.

Andrew Bell:

Thanks very much, Joanna, kicking us off for this day three. And talking about the hop in platform, there are lots of things you can do there. You can comment, as Jo just said. Also, you can ask questions during our sessions. If you're new to hop in today, we know there are people joining us every day of this event, you should have received this handy guide. We've got three top tips for hop in, use Google Chrome, use headphones, because that's the best way to go and if things get a bit fuzzy or the picture freezes wherever you are, a refresh will do you well, it usually sorts out issues.

Andrew Bell:

The answer lies in the soil, someone once said, and that's where we're going to start with our presentations, Troy Clarkson, is assistant director at DAWE the department and he's going to be talking about the National Soil Strategy. We were told yesterday by Jay Kennedy, that all things come from country, all things agricultural or many things agricultural come from the soil. This is a key element. Troy, let's hear what this soil strategy is?

Troy Clarkson:

Great, thanks Andrew. Absolutely everything does come from the soils and today is an exciting day when I can talk about some of the new measures the Australian Government has committed to, to improving soils and its National Soil Strategy as mentioned by Jo. So, as we know, $63 billion per year comes from an economy from agricultural production alone and most of this comes from the soil. And 95% of our food comes from the soil, so the way we manage our soil is critical and crucial. We're looking to increase productivity by 58%. And of course, the answer, or a lot of the answers, come from the way we improve, the way we manage our soils.

Troy Clarkson:

So soils is an opportunity. It's an exciting area where we can start to understand our soils and better manage them. And certainly the measures announced by government recently is to do exactly that, understanding our soils, so we can better manage them. So, why soil is important for drought resilience? Well, obviously what we need for plants is soils, but also water storage, and certainly through improved management practices and improving soil carbon, organic matter, soil structure, infiltration rates, we can store more water in the soils and provide a more resilient landscape when it comes to droughts. So, soil management is crucial and we'll talk about some of the measures about how we can improve soils.

Troy Clarkson:

So, government launched the National Soil Strategy with budget back in May this year. The National Soil Strategy primarily came about back in 2019, when the Prime Minister announced the national need for a national policy on soils. And that came from the good work of the previous and late national soil advocate, Major Michael Jeffery, who has been advocating the importance of soils over a number of years, and certainly has then led to this commitment from government and this significant funding, which hopefully we'll start to get a better understanding of how we achieve progress to improving ourselves across the landscape.

Troy Clarkson:

So, with the National Soil Strategy, we've engaged with hundreds of people all of last year to certainly get their ideas and views about what the priorities should be as far soils in Australia and this is now being captured effectively in the strategy and now we're looking to move forward to improve the way we manage them. So, underneath the strategy, our vision is that Australian soil is recognised and valued as a key national asset by all stakeholders. It is better understood and sustainably managed to benefit and secure our environments, economy, food, infrastructure, health, biodiversity and communities now and into the future. And we've got three key goals we're focusing on in this National Soil Strategy and that is prioritise soil health, empower soil innovation and stewards and strengthen soil knowledge and capacity.

Troy Clarkson:

So, with the National Soil Strategy, also recently launched the Commonwealth Interim Action Plan. So, with the Commonwealth Interim Action Plan, that captures all the activities that Australian Government, the Commonwealth, is delivering in improving soils. So, this is just a starting point. What we want to do now is certainly understand, not only what the Australian Government is committing to, but what all stakeholders and all governments are committing to across Australia. So, over the next 12 months, we're committed to developing the National Action Plan, which will capture all soil activities, so we can think about how we can collaborate, how we can coordinate, how we can leverage, how we can co-invest in addressing some of the main or major soil priorities across Australia.

Troy Clarkson:

So, this particular diagram shows the journey so far and I think it's fair to say that we're only halfway there. And what I'll talk about now is some of the measures that was announced recently with budget and how we're going to implement these over the next couple of years. So excitedly, the government announced a package of $214.6 million across a number of measures to look at understanding our soils and to better managing them over the next decade or so. So, I'll go through each of these measures and explain what they are, what we're thinking, and certainly be available to take questions as we go along, or at the end, sorry. So, it's fair to say that with the measures, they're all linked. So when you think about strategically how we deliver these and ensuring that we're getting maximum value when it comes to understanding data, how we store that data, how we use that data for management decisions and how we actually report on the outcomes of those management decisions.

Troy Clarkson:

So, starting with the National Soil Monitoring and Incentives Pilot Program. So, this pilot will be run over two years and it is exactly that, a pilot, so we'll test a few approaches in how we might capture information and then we'll come back to cabinet in two years' time to, I suppose, reflect and review on how progress was made and to look at next steps on how we can continue the journey when it comes to soil management. So, the first measure I will talk about is the review of existing soil data. So, this is a $2 million project which will be delivered primarily over the first six months or so of the project life. This particular piece of work will set the foundation for the other measures. Basically, what we're looking to do is to assess and work out what historical soil data is already available. When we do the assessment process, we'll be assessing against quality and value.

Troy Clarkson:

So, when I talk about value, I talk about the value, how this informational data can understand and contribute towards agriculture productivity and resilience. So, when it comes to data sources it could come from government, universities, NRM groups, industry and farmers themselves. Some of that information will be publicly available already and some of it we're looking to make publicly available in the near future. So, this leads to the next measure, which is the data capture payments. So this is actually looking into working with farmers and agronomists to again, understand which of that data sets are out there, which is of value, and how we can make that data available? Obviously, thousands of farmers have conducted regular soil testing over the years and we need to understand what those soil test results look like and how we actually utilise that information to help us better understand our soil condition and our trends.

Troy Clarkson:

So, we will look to pay farmers to help them share their data and make it publicly available for all Australians. In doing so, we've got to recognise the importance of maintaining privacy, but also making sure that we've got accessibility to this information. The next measure is about how we actually display or show this information and that's basically upgrading the Australian Soil Resource Information Systems or ASRIS, which is currently hosted by CSRIO. So, this is looking to improve the visualisation and the database so people can easily access all soil data. It also recognises that we've got a number of soil information systems across the landscape. So, it's about how we actually improve the data quality and also the accessibility of these different systems and to ensure that all these different systems are federated centrally to a central location under ASRIS, so everyone can easily access this information in an effective way, so this one's $15 million over two years.

Troy Clarkson:

Now, the next one underneath the National Soil Monitoring and Incentives Pilot Program is the rebates. So this is rebates to farmers to help pay for soil tests. So, we're going to do this for a few reasons. One, we want to provide incentives so data becomes available for the broader Australia. So those people who opt in will need to share their data, but it's a few objectives. One is to increase the rate of soil testing at the moment. Currently grain growers are soil testing regularly at about 15% of growers, our broad average grazers at 10% and dairy farmers at around 20 to 30%. So, clearly there's capacity and opportunity to increase the rate of soil testing, so farmers have got more information and new information to make informed decisions in a way that improves their management practices.

Troy Clarkson:

The other element is to improve the quality of soil testing. And when I talk about quality, I mostly talk about the quality of sampling. There is an opportunity to improve the way we sample, whether it be at different soil depths or across the paddock in plots. So, we're looking to working with laboratories and agronomists to help to deliver these measures. It's fair to say that we are committed to remove the administration burden on the farmers to ensure there's an increased uptake, so we're looking to work with labs, for example.

Troy Clarkson:

So, when a farmer goes out and conducts a soil test and puts their samples in their bags and sends it off to the lab, the labs will do the analysis and they will only charge the farmer the reduced amount, and then charge the government the difference of the rebates for the total cost of the product. We're looking at variable rates also, when it counts to soil testing. So for example, we may offer 25% rebates to measure Olsen P but may provide a higher rate for another soil property, such as soil carbon, let's say 75%, because there's probably a lot more public benefit for that particular property. So, we're committed to actually working through and prioritising where these rebates are delivered across the landscapes and certainly the review process as mentioned earlier, will help us identify that. The aim or the intent is to ensure that we're capturing as much soil data as possible, so all Australians can use this information to make decisions.

Troy Clarkson:

So, to support these measures, we've also got some funding for extension services. The Extension Services Funding is $18 million over two years. It should be recognised this is not new funding, this is actually existing funding from the Smart Farms, Small Grants program. So, this funding will now pay for extension officers and will not pay for the next two rounds of small grants under the Smart Farms program. So, how will this be delivered? Well, one of the models we're looking at is to actually have some high level expertise soil coordinators around landscapes, let's say 10 or so.

Troy Clarkson:

These coordinators will actually help design and deliver the extension package. They will come together as a communities of practice to actually use their expertise to work out what's the best way of providing services and support to farmers, to help farmers interpret their soil tests, to improve the quality of their sampling, to make more informed decisions and to be more productive. So, these coordinators will then oversee the extension officers, so the extension officers will also be funded through this package and it may be 50 or 60 of them across the landscape. The extension officers will work directly with farmers, farmer groups, but also working closely with existing advisors out there in the private sector, like agronomists. Working with them to improve their capability to improve their services, so it is a better product from a range service providers out there for farmers in a way they understand their soils and make management decisions.

Troy Clarkson:

So, there are a few other measures. So this one is quite an exciting one, and this is actually coming out with an agreed National Land Management Practice Classification Systems. So as we know, we all talk about management practises and we do talk about them slightly differently. Sometimes there's confusion out there and we have to try to get a more consistent way of describing and explaining and talking about different management practices. Terms like regenerative farming has been quite polarising out there in the community and we're looking to clarify an understanding of what these sorts of terms mean and don't mean.

Troy Clarkson:

So, we'll be working with our group within the department ABARES to essentially look at working out how management practises are currently classified across the industry and then conducting a number of workshops to try to get an agreement about how we actually classify these manager practices moving forward. This will also help with the rebates project, so when we go out there and do soil testing and understand the condition and trends of our soils, we also understand the relationship of our soils with management practices. The power of understanding management practices associated with soil condition and trends, and then even productivity, it will be very powerful to understand how we actually target our investment in the future.

Troy Clarkson:

The next measure is the Soil Science Challenge Grants, so this is basically a grant for research. It's $20 million over four years and so we're looking to look at wicked new ideas and how we actually invest in new soil science. And certainly, we're going through the process now of understanding what the themes are, but it could be great opportunity here to do some good soil research in the space of drought and building up resilience. So certainly, if you've got some good themes or good ideas when it comes to soil management, we look forward to your ideas.

Troy Clarkson:

Next one is enhancing Soil Education Expertise Grants. That's only a small project, $1 million over two years, but basically it's recognising that we need greater soil professionals out there and improving their standard and their accreditation, so we've got a succession planning so we can make sure that a lot of the people who are now reaching retirement age are being replaced by qualified and accredited soil professionals that can go and deliver extension research development and ensure that the soil is growing area and we've got the support for farmers to making those decisions in the future.

Troy Clarkson:

Outside this package, but also funded through the Australian Government is the Soil Carbon Initiatives. This is being managed by the Department of Industry, Science, Energy and Resources and certainly our department is working very closely with them. They're delivering $36.7 million National Soil Carbon Innovation Challenge Program and that will be conducted shortly. And the focus is to accelerate development of low cost, accurate soil carbon measurements and technologies. They've also got a $7.9 million Soil Carbon Data Program and we're looking to tie into that with our data program to ensure that they're complementary and not duplicative.

Troy Clarkson:

So, in conclusion and as I mentioned at the start, soil is crucial when it comes to building on drought resilience. The government has made a commitment now to improve soils and will utilise this opportunity to ensure that key priorities are addressed in the future. And then, we're working closely with our partners to address these in a collaborative and coordinated way to ensure we deliver effective outcomes. Thank you.

Andrew Bell:

And thank you, Troy. We are open now for questions, already the Q&A box has been busy and we'll try and get through as many of your questions as we can. Rest assured for this session and all the other sessions during this forum that if the questions aren't asked out loud, they are noted by the departmental team and they will be, as we say, capturing them.

Andrew Bell:

Right, okay let's get onto questions which have been coming from far and wide, Troy. Let's start with Pete Fiet. I hope I've got your name right there, Pete. He says, "Great to see production benefits from soils and how well managed soils give drought relief. Is the strategy open to the concept about how well managed soils also provide flood relief?" So it's about quality of soil.

Troy Clarkson:

Yeah, definitely, so obviously our objectives is to improve soils. And when it comes to improving soils, it's about managing all soil constraints and degradation, and of course, by improving the water holding capacity of soils and also improving the resilience against erosion, that would certainly help with that flood relief element and it should also recognise that the strategy itself is a fairly broad document and it has a number of themes.

Troy Clarkson:

Obviously, what I've spoken about today is the measures for the next couple of years. There's opportunity to then look at new measures in the next couple of years about how we actually better invest in the soils and some of that might be more focused on flood relief.

Andrew Bell:

Great, Mic Mark Heckman asks, "Could the soil extension officers have a strong soil conservation focus, not just a focus on nutrients?"

Troy Clarkson:

Yeah.

Andrew Bell:

Is that about how we change the way we think about soil? This is all part of this change of thinking, which overarches this event?

Troy Clarkson:

So, definitely we're looking at the scope of the extension officers and certainly one element has mentioned it will be to support the nutrient side of things when it comes to fertiliser interpretation, but it's also recognising that soil conservation and managing soils from erosion and the impacts of erosion and nutrient runoff is also crucial as well. So we're exploring a scope of those extension officers, and certainly it may depend on the region they're working on, but we'll be actually working with them to ensure that they're addressing all soil priorities, not just the nutrient side of things.

Troy Clarkson:

And it's probably also recognising that soil extension officers used to be in quite high numbers many years ago, and we used to have a whole department, the Soil Conservation Authority, we used to focus just on soil conservation and some of those services have dropped off, so we need to think about how we actually bring some of those services back in to support farmers to address some of those issues.

Andrew Bell:

That's in the future. John Reeve asks, "How is government encouraging private sector investment into the soil carbon opportunity, recognising there's a short-term cash flow barrier for change in new infrastructure and all the rest of it." It's sort of the bridging part of the operation.

Troy Clarkson:

Yeah, definitely. So, that's going to be critical and through the Developmental National Action Plan, obviously we're looking to understand and recognise all soil activities happening out there from various departments, that includes how we improve soil carbon. So, we'll look to capture that in the action plan and work out how we can potentially co-invest with private sector in that area, and certainly be working closely with DIESR, Department of Industry and Environment and Resources who are focusing on that particular elements of soils to ensure that's an opportunity there for co-investment.

Andrew Bell:

The questions are coming in fast and furious, which is fantastic. Sharon Watt asks, "Do existing accredited laboratories have the capacity to accommodate the likely increase in demand for soil testing?"

Troy Clarkson:

Yeah, good question. So, I have been talking to a few of the labs and obviously we're looking at ASPAC accredited labs to ensure there's quality of analysis being conducted and a level of consistency. And certainly, the labs have indicated they've got the flexibility to actually up their skills and up their staffing and their resources to support hopefully the increased demand in soil testing, because exactly what we're after.

Troy Clarkson:

And it's also probably recognising that these types of rebates have been delivered, not on a national scale, but on a local scale and has been really, really good outcomes from that process, because not only do farmers jump on board, but as a result, they also increase the quality of their sampling, even beyond the life of the project.

Andrew Bell:

Fast and furious questions, we've got a fusion question now from James Rowe and those watching the event down the road at The Shine Dome here in Canberra. "Hi, Troy, is there any project or other specific mechanism linking the soils program with-

Andrew Bell:

the future drought program? How can soil monitoring help support the future drought fund FDF, with measuring progress towards achieving more drought resilience?

Troy Clarkson:

Yeah, good question. So the answer is, yes, we'll be working very closely with the drought future team, obviously by understanding the condition of soils, understanding elements or properties such as structure, carbon, will also help us understand things like water holding capacity.

Troy Clarkson:

And certainly we can use that data to develop products, and that could include soil resilience, I suppose, models or maps, which shows the landscapes, which areas are more resilient against drought, and which ones less. So

Andrew Bell:

Maree Gooch says, great presentation, Troy. Good on you, thank you. And asks, is there a universal carbon measurement tool? She says, there's a deal of confusion about which one to use. Adding, the noise out there is very loud.

Troy Clarkson:

Yeah, good question. And it is loud, and it's probably recognising the measure I've mentioned on the SOC Harvard innovation sort of grants, and that is to look at things like how we get some more Akron effective ways of measuring soil carbon.

Troy Clarkson:

Obviously at a paddock scale, so we'll be working with various agencies to actually work out the best way forward. So I suppose we haven't got the answer now, but we're certainly looking to answer that question in the future.

Andrew Bell:

And I think we've got time for just one more question coming from Tony Kennedy. We've seen many dust storms recently, which as we all know, sees that top soil blown.

Andrew Bell:

In fact, we had a map from our friends, I think in WA the other day, showing us how that has been changing over the last decade. Will the National Soil Strategy investigate ways of preserving all soils?

Troy Clarkson:

Absolutely. And ground cover and protecting ourselves from impacts, or issues such as wind erosion, and water erosion is one of the key priorities of the strategy.

Troy Clarkson:

We haven't got specific measures, certainly underneath the Commonwealth sort of budget, which was announced recently, but obviously by improving nutrient levels, it will improve ground care, which improve resilience against wind erosion.

Troy Clarkson:

But it's also recognising we've got other projects which Commonwealth have invested in, such as the National Land Care project, which invests in specific projects, which address wind erosion and water erosion.

Troy Clarkson:

And then certainly we'll be looking at monitoring through the data collection work we're getting, about where those erosion risks are highest, and how we can actually tie that on investment in the future, try to address those risks moving forward.

Andrew Bell:

Thanks Troy Clarkson for addressing many, but not all of the questions, but rest assured Troy will have a look, as will the rest of the team, at all your questions, and this is an ongoing conversation, I'm guessing?

Troy Clarkson:

Exactly Andrew, and I will be engaging with many people about how to best deliver these measures moving forward, so we look forward to having that conversation.

Andrew Bell:

Thanks very much for joining us this morning, here, live in the studio. Plenty going on here on our final day of the Future Drought Forum. Don't forget, we've got the major session, starting at around about 20 past 11, Eastern, 10 to 11-ish in the centre, 20 past nine, over in the West.

Andrew Bell:

And it's Science into Practice, the bottom line of this event, if you like, and that'll be well worth listening to. We're getting to the real meat and potatoes of what we've been discussing.

Andrew Bell:

We've been talking about our ideas of changes at practice, now we're really firming it all up. Don't forget, if you want to ask a question, you can go into the Q&A box, I know you're having a conversation in the comments section as well.

Andrew Bell:

All these interactions are being noted, and will be acted upon, in some shape way or form. It's a bit of musical chairs in the studio this morning, Troy has gone, Ryan Wilson has come in. Hello Ryan, how are you?

Ryan Wilson:

Good thanks, how are you going?

Andrew Bell:

I'm pretty good, actually. We've heard about soil, now we're hearing about stewardship. We heard about stewardship of soil in Troy's presentation. Ryan Wilson is here also from the Department of Agriculture Water and the Environment.

Andrew Bell:

And your program develops arrangements, it says here, to reward farmers for protecting bio-diversity. Another building block, I guess, in all of this. Questions for Ryan, once you've heard his presentation, as you hear his presentation. Over to you.

Ryan Wilson:

Okay. Thank you, and good morning, everyone. So yeah, as you say, it's about stewardship, this time about biodiversity is really the focus here.

Ryan Wilson:

And that's sort of recognising that many farmers can have by diversity assets on their farm, or could improve those assets, and there's a real commitment from the government and Minister Littleproud in particular, to identify opportunities for farmers to be rewarded for that stewardship of biodiversity on their properties.

Ryan Wilson:

So I'll go through the outline of the program here. So this is the Agriculture Biodiversity Stewardship Package overall, it has the sort of main component. So there's a couple of biodiversity stewardship pilots, and that's one of those has been in, you know, there's been a bit of social media coverage of that recently, we just closed for applications.

Ryan Wilson:

So I'll talk about those pilots in a little bit of detail. There's a biodiversity certification scheme, a sustainability framework, which is more generally about sustainability overall, and a biodiversity trading platform.

Ryan Wilson:

So this is a little bit more about the biodiversity pilots, so the carbon plus biodiversity pilot is something has recently, we've had open for applications, and that's really a project... And I'd emphasise these pilots are definitely are pilots.

Ryan Wilson:

So we're trialling in certain regions just to get the protocols tested out, and make sure it's working before looking at more wider application, and definitely the minister is ambitious to apply these more widely.

Ryan Wilson:

So in the carbon plus bio-diversity pilot, which has just closed for applications, the idea is a farmer applies for the biodiversity pilot, and for an emissions reduction fund project. So where the emissions reduction fund is essentially as a carbon project, under the government scheme.

Ryan Wilson:

And essentially, they do a new plantation, but they do that plantation according to certain biodiversity protocols, that have been developed in collaboration by the Australian National University, and in consultation with regional stakeholders, to make sure the biodiversity plantations are most appropriate for those particular regions.

Ryan Wilson:

So applicants, people apply for these projects, so biodiversity and carbon plantation, a new plantation, there's a competitive round, and essentially the government will then make a price offers.

Ryan Wilson:

So we offer a certain dollar value per hectare of that plantation to the most competitive projects, and then, yeah, then an offer is made and then the farmer can go out and make that plantation. So that's how that scheme works.

Ryan Wilson:

Yes, and probably the thing to mention about that is, the idea is so the farmers would own the carbon credits from that scheme, so that's a potential future. So carbon credits can be sold at under various arrangements, either to the government, as part of their carbon goals, or to the private sector.

Ryan Wilson:

And then that biodiversity payment upfront makes the project overall, and economically viable sort of arrangement. And as I was saying, there's a pilot, so the idea is we're really testing this to do it in the way for the private sector.

Ryan Wilson:

Would buy carbon credits with a biodiversity component, so the idea is to trial that, to set up the technical protocols, to test those in a scientific way to make sure this all works, and then with the longer term vision of taking that to market, and getting private sector investment.

Ryan Wilson:

Because there is some interest in private sector investment in biodiverse carbon, which I'll talk about a bit more later. The other pilot is enhancing remnant vegetation. So that's really where a farmer has some sort of significant vegetation, like native vegetation on their farm already.

Ryan Wilson:

And under this scheme, which we haven't opened for applications yet, we're sort of in the sort of final program design phase. Under this scheme, a farmer could undertake to do certain actions to improve, enhance that vegetation in some way, over and above just what they're basically required to do under environmental law and that, and then receive payments for that.

Ryan Wilson:

Again, both of these pilots are essentially long-term commitment, so you commit for the longterm to do these things, which gives the purchaser of that biodiversity, some sort of assurance they're buying a real thing, but also then creates an alternative income stream for the farmers that are participating, that isn't really dependent on the wet stuff that falls out of the sky.

Ryan Wilson:

So under this enhancing remnant vegetation pilot, we're looking to open that sort of later in the year, and in, again, the pilot looking at around potentially 140 farms, depending on the level of interest.

Ryan Wilson:

Okay. So those are the two pilots, again, just emphasising, we've been working a lot with ANU on this to design all the technical kind of protocols, and the way in which we'll do the piloting. And so we are really trialling, that and looking to see how to make this work well, so we can over time then scale that up.

Ryan Wilson:

The other thing I mentioned, the Farm Biodiversity Certification Scheme. So this is really about farmers who are doing the right thing, and doing that what's appropriate in their region as well, because each region is very different.

Ryan Wilson:

And this is where farmers can get essentially a green tick of some sort, that they're doing the right biodiversity-friendly actions on their farm, and that could be plantations, or revegetation or certain management actions for their existing biodiversity.

Ryan Wilson:

And the idea of that is that there's this sort of growing interest in sustainability credentials of many sorts, internationally, as well as in Australia purchasing. So the idea is that farmers who are doing the right thing in a biodiversity sense, will be able to get sort of a certification for their product.

Ryan Wilson:

So like the others, we've got essentially the technical designs for this scheme, and we'll be sort of working to trial later through the course of the rest of the year, and integrating those with the two biodiversity pilots that I mentioned before.

Ryan Wilson:

So this one is missing the title, but what this is, is the Australian Agriculture Sustainability framework. So one thing agriculture stakeholders have been saying for a while, is there's lots of different sort of sustainability standards out there.

Ryan Wilson:

There are a lot of private standards, of one sort or another, and so the idea with this work, this one is in collaboration with the National Farmers Federation, is to look at all the different schemes out there, look at the sort of way these sorts of sustainability schemes operate.

Ryan Wilson:

And come up with, I think, what are slightly bureaucratic terms, a meta-standard. Essentially the idea is that, what's that common standard that unites them all, and is the best way of doing a sustainability standard?

Ryan Wilson:

So it very much leaves with industry and different sectors, they have to have their own sustainability standards that are right for them. You know, cotton is not livestock, is not horticulture, but what this does, this creates that common kind of benchmark that everyone can use as a reference point. And we'll sort of, again, link in with the other bits of work, particularly the certification scheme.

Ryan Wilson:

So the NFF is working with a bunch of partner organisations to develop the sort of technical details at the moment, and in the coming months expecting there'll be some sort of consultation.

Ryan Wilson:

There's been a bit of consultation, and work with stakeholders already, so this is where now in that kind of, you know, at the pointy end of working out exactly what's going to be in this thing, and checking that out with all the stakeholders.

Ryan Wilson:

We seem to have missed the title on this one, this is a Biodiversity Training platform. So I was saying uniting idea of a lot of these bits of work, is that, it's about trying to leverage that market interest.

Ryan Wilson:

So there is some private sector interest in paying for biodiversity of one sort or another, and the pilots and the certification scheme we're doing the technical protocols about, how do you actually do that on a farm, what's a sensible way to do that.

Ryan Wilson:

What sort of legal agreements need to be involved? What are the prices that people are willing to pay, or that a farmer is willing to do these projects at certain prices? So that's what all the previous bits of work are about.

Ryan Wilson:

This here is really about providing that platform, where those who want to buy biodiverse carbon say, or improved biodiversity in a yellow box woodland or something like that, that a farmer might have.

Ryan Wilson:

This is a place where both buyers and sellers can go to a little bit like a Gumtree, but a Gumtree with the Gumtree app, but with quite fancy maps sitting behind it, spatial information, so people know what assets are out there.

Ryan Wilson:

Buyers and sellers can go and register on this platform, and that allows them to find each other, and essentially make a commercial, sort of arrangement, potentially with governments as well.

Ryan Wilson:

So this is all about the voluntary market, so we're not getting into sort of compliance markets at this point, but there definitely is a voluntary market there around biodiversity, which I think brings me to the last slide, just a quick... I'm talking about markets, and this is really what what the vision is with all of this.

Ryan Wilson:

Is to actually leverage that private sector interests in paying for biodiversity services, and then finding ways that farmers can be part of the action on that. So for instance, so biodiversity markets, some profit and not-for-profit organisations are keen to invest, in either new or enhanced biodiversity.

Ryan Wilson:

There are businesses that are out there that have carbon targets, so they have net zero targets as a business, but they don't want just carbon, they're looking for carbon with biodiversity, so that's a real opportunity there.

Ryan Wilson:

Banks and lenders potentially have an interest, in the sort of productivity improvements you can get on farm, through biodiversity stewardship actions. And as I said before, there's a market demand for sustainability credentials of one sort or another. So there's a real sort of opportunity growing here.

Ryan Wilson:

And then in the centre really just emphasising, this is not purely about those who were looking to buy it, that farmers can do these sort of activities in ways that also benefit their farm business.

Ryan Wilson:

So the best example is the carbon plus biodiversity pilot, where if you do that the right way, not only do you get carbon and biodiversity, you might also get a shelter belt.

Ryan Wilson:

And then a farmer can sort of build that into their farm business model, using bits of land that might be less productive otherwise, but this becomes a new way of using that bit of land that is valuable. So I think that's, that's it for the presentation, happy to go to questions.

Andrew Bell:

And there are plenty of questions to go to, the Q&A box is burning red hot so far this morning. So let's start with a question from Niall Blair, how are you going to connect with existing schemes, such as the new South Wales biodiversity conservation trust?

Ryan Wilson:

Yeah, so in all of this, we've been very aware of what the other schemes that are out there, particularly the state governments, the biodiversity conservation trust. Also Queensland has the land restoration fund, and some of the other state governments are looking into similar things.

Ryan Wilson:

So we're working closely with them just to make sure, we're not duplicating or creating competing schemes, because we don't want to make life harder. But at the same time, this is a new endeavour, so everyone is trialling these things, and we're all talking to each other about the lessons we're learning, and there there'll be ongoing conversations with state governments.

Ryan Wilson:

In particular about making sure we're doing that in a complimentary way, and constructive federalism rather than competitive.

Andrew Bell:

Still on the sort of duplication area, Julia Mckay, can you double dip for biodiversity? There you are, I did it, diobiversity. I knew I was going to do this, and soil carbon, or is it tree carbon only? Asked Julia.

Ryan Wilson:

So these schemes that we're talk about are about vegetation, so it is the tree carbon.

Andrew Bell:

How about remnant vegetation? Kirsty Cooper asks, will the remnant vegetation pilot look at smaller properties, as well as larger ones?

Ryan Wilson:

Absolutely. So, at the moment, the way we're doing the pilots, we're focusing on the intensive agriculture areas. So not the larger properties you find in the range lands, at this stage of the pilot, and there are some other schemes that focus more on the range lands, for example, in Northern Territory.

Ryan Wilson:

So, yeah, and the carbon plus biodiversity pilot for example, is available for plantings between five and 200 hectares, so not necessarily those very large projects.

Andrew Bell:

Nicole Raquel asks, what about livestock producers up North, who graze native pastors and grasses, planting shrubs, or woody vegetation for carbon credits is disturbing these pasture systems, what are their options in all of this?

Ryan Wilson:

That's a good question. It probably depends a lot on the property itself and the vegetation. So-

Andrew Bell:

There's no one size fits all?

Ryan Wilson:

There's no one size fits all. And that's partly why we're trialling, so we've got to trial, we're using the NRM regions, we got six NRM regions, and we're really looking to learn lessons like this are. So when you try and do this thing in this region, you go, oh, there's some rule in state legislation that we didn't think of.

Ryan Wilson:

Or how does that actually make most sense in this type of past your system? So I think those are the sorts of lessons we need to learn in our pilots, but it would depend on the pilots like it.

Ryan Wilson:

So potentially under the enhancing remnant vegetation, that might still be an option, where you do some sort of management action that improves that native vegetation, native pasture, but you can do that as part of a productive farm business.

Andrew Bell:

Elizabeth Coonan is asking, in what ways have these approaches been developed using local place-based, or indigenous knowledge, to identify approaches to improve biodiversity. That is getting right to the hyper lople, I guess?

Ryan Wilson:

Yeah. So we've got a collaboration with the NRM regional organisation, in each of the regions. So we're working with them on getting that local knowledge built in to the program as much as possible.

Ryan Wilson:

But again, we can always learn that, as we roll that out, I think that is something we'd be keen to keep doing through the local organisations.

Andrew Bell:

We're looking ahead, but Maree Gooch has a question that's sort of looking ahead, but also I'm looking in the rear view mirror somewhat, is their scope with the new measurement tools to measure existing plantations?

Andrew Bell:

Meaning reward, those who have been investing in this space on their farms for many years, so there's an encouragement element there.

Ryan Wilson:

Yeah, certainly the measurement tools potentially could be useful in that. And there are a lot of things, like our measurement tools are sort of based upon sort of existing science, and some of the existing carbon, like the carbon models having the models called full cam.

Ryan Wilson:

For those that are familiar with the technical details, so there are carbon models that are being used as part of that program. I mean, the program itself is based on new vegetation, or new actions on vegetation.

Ryan Wilson:

So it isn't really applying to the past sort of previous activities, but I think those who are already doing that, it's probably, thinking of this as, this is a business enterprise, and a market opportunity that is growing.

Ryan Wilson:

I think those who are doing that are actually well-placed, they've got that first mover advantage, so they can I think look at these new schemes coming out with very well-informed eyes, I think.

Andrew Bell:

Now you mentioned the meta scheme. And we have a question about it from Wesley Ward, how will the sustainability scheme (meta scheme), be related to sustainability development goals? Indeed, will it?

Ryan Wilson:

Certainly the sustainability development goals are part of that kind of landscapers, to sustainability frameworks and standards and what have you. So with the NFF and their partners, as they're developing that standard, they're looking at all of those things, both of those sort of global political goals.

Ryan Wilson:

So the STGs are that sort of high-level agreement between governments, but also the commercial scheme, so there are all sorts of commercial certification standards.

Ryan Wilson:

So in developing that standard, we're looking at all of those things, the NFF and their partners are looking at all of those things, and we'll take that into account. So certainly it will be consistent, and it will be designed with all of that in mind, so.

Andrew Bell:

Ryan, you've answered so many questions, we've got time for just one more. But all the other questions that have been asked are being noted, will be put on the record, and all the rest of it.

Andrew Bell:

Catherine Evans ask, are there specific markets or examples, to illustrate that people are actively seeking the certification scheme proposed. So I guess it's asking for hard and fast evidence there.

Ryan Wilson:

Yeah. So, probably can't sight a specific example, but we do see governments looking more and more intently at sustainability standards. And biodiversity is a current focus globally, so if you look at all the, you know, the G20s, and the conferences of parties on climate and biodiversity, there's a lot of talk about biodiversity globally among government, and perhaps that's really a signal of where policy-making is going.

Ryan Wilson:

But you do see particularly in the European markets, and now after Brexit, with the UK, that sort of made them more complex, but there's this sort of signalling going on, that is, that is seeking those sustainability credentials.

Ryan Wilson:

And I think that certainly anecdotally there are commercial examples, but it is a growing thing, so there's probably a real life commercial element now, and there's also a strategic element where this is coming, the train is coming down the lines of, we need to be ready-

Andrew Bell:

Be ready for that.

Ryan Wilson:

Yeah.

Andrew Bell:

Ryan Wilson, thank you so much, and thank you for being so open to answering all those questions. I, for one cannot wait for Gumtree to actually live up to its name, if you're opening that app, but anyway, thank you so much for joining us.

Ryan Wilson:

Thanks everyone

Andrew Bell:

Another live presentation here from the Future Drought Fund Science to Practice Forum. If you've been sending in questions, thank you so much for engaging, also in the chat that's going on in the comments section.

Andrew Bell:

Well, our next topic, agriculture, innovation, agenda, we're all about that here, and we'll be hearing indeed from how that's been approached from our last two hubs a little bit later on today.

Andrew Bell:

That's South Australia and Victoria, the Hubs, the lucky last two will be coming along at about half past one Eastern, one o'clock Central, and half past 11 in the West. That's after our lunch/brunch break.

Andrew Bell:

Christine Mulhearn is a director at the department, hello, welcome onto the set. And you're going to be talking to the agricultural innovation agenda, only three words, I'm guessing it's a pretty long agenda over to you.

Christine Mulhearn:

Thank you for having me, and it is a big agenda, but I first want to start out with a little bit of a story. So this story is about pineapples and lentils, and I know that makes people laugh and think, well, what does that mean for innovation?

Christine Mulhearn:

But it's really about the mindset you have, and how a producer, it doesn't matter what you've produced, whether that's a pineapple or a lentil, or you grow wool or wheat, or you're part of the supply chain, but how do you think a little bit differently?

Christine Mulhearn:

So pineapples are lovely thing, they're in season right now, and you go to the supermarket, you see nice big groups of them. But actually most people don't buy a pineapple from the supermarket. Woolworths like to sell them, because they tell me about 8% of when there's a big pineapple display, their market goes up about 8%.

Christine Mulhearn:

People buy more things. They buy more juice, they buy more tropical fruits, they think summer's coming. But the pineapples we sell aren't quite that great. They're varietals from the '50s, they're a little bit static.

Christine Mulhearn:

Pineapples are actually very delicate things, they're that hard to transport, and they're hard to keep safe, so people don't buy them as their a bit messy to produce and eat. But if you got to Costa Rica, you can buy a pink pineapple, and I mean, bright pink, highlighter pink, the pink of your dreams, and it costs you about $150, U.S.

Christine Mulhearn:

And there's a three-year waiting list, I'm on the waiting list, I'm waiting to see... I'm at two and a half years to go on my waiting list, but we'll see how we go.

Christine Mulhearn:

So what makes us grow the pineapples we sell here for about three or four dollars at the supermarket, that a yellow and not quite great to eat and consumers don't want to eat them, and what makes Costa Rica go pink pineapples, that there is a three-year waitlist for?

Christine Mulhearn:

And then you can think about it differently, let's talk about lentils. There's some great farmers in the Pinaru who've been growing red lentils. Red lentils are amazing things, they're full, absolutely full of protein.

Christine Mulhearn:

And these farmers grew their lentils, but unfortunately they got chipped, weather happens, drought happens, and they could only sell their lentils for animal feed.

Christine Mulhearn:

And I decided that look, that wasn't going to make them enough money, it wasn't where they wanted to sell their product, they knew their product was better, hence they trialled making red lentil flour.

Christine Mulhearn:

And they just did it domestically to start with, they sold to a few friends, they sold to their local bakery, and it's just taken off. Now that lentil flour sells for about $11 a kilo, plus postage. They could sell them by the tonne for cents, for animal feed.

Christine Mulhearn:

That business has now taken off in the last 18 months to the point where they're selling it by the metric tonne, they've had to change the name of their business, and expand out because they can't grow enough lentils on their farm. They're looking at moving into all the major retail markets, and then eventually overseas.

Christine Mulhearn:

So what's different between those two stories. What's the mindset from the producer that says, you know what, I'm going to do something different? And that's where if you think about the drought hubs, and where we are as a country, it's really exciting, there's that mindset where we can make a change.

Christine Mulhearn:

Australia's are great at innovation, you look at the wonderful things we've produced over the years. So how do we have a mindset as a country, as producers, as people in the supply chain to do something different, to see it in a different way?

Christine Mulhearn:

That's really what innovation is about, it's not just buying the latest new iPhone, or having enough Wi-Fi in the back paddock to watch the Kardashians, although if you'd like to do that, that's absolutely up to you. But it's at that mindsets, that how do we do things differently?

Christine Mulhearn:

How do we grow things differently? How do we produce things differently? How do they have more value? What differences do we make? Those couple of stories are part of the stories that we hear a lot about innovation. We talk about the challenges, we talk about the opportunities.

Christine Mulhearn:

So there is absolutely unprecedented change happening right now. We need to think about all sorts of different things, natural disasters, global markets, climate, and different sorts of shocks. COVID has been, I think it has allowed us to reset.

Christine Mulhearn:

It has also been an absolute, amazing opportunity for agriculture. How can we say that the products we produce are clean and green, and worth the premium that people want to pay for it. People want to know how their products are produced, and what's the best benefit for them.

Christine Mulhearn:

If we want to get to that 20, 30 number, which is a hundred billion dollars, there needs to be really big changes and transformational gains. This space is really crowded. When I talked to lots of people across the country as I do, there's lots of different things happening, and people don't always know what to use and how to use it.

Christine Mulhearn:

And so part of what we're trying to draw together is, what is the system, and then how can we better use it? How can we utilise all the wonderful things that are happening to be a bit different, and a bit better? The national agricultural innovation agenda was going to start with a policy statement, with four new priorities.

Christine Mulhearn:

We talk about different things that are happening, and different ways of being, but as I said, it's not just about the big picture, it's about what you can do on the ground and how you can do it differently. They'll also be a digital foundations for agricultural strategy, because yes, digital is very important, digital is a way we can do all sorts of different things.

Christine Mulhearn:

You're only talking to agricultural innovation just after me, but agricultural innovation Australia has been set up by the 15 research and development corporations to look at the big cross sectoral challenges, climate, soils, like the information you heard from Troy earlier.

Christine Mulhearn:

But talking about, there are things that no matter what you produce or how you produce it, or the supply chain you're part of, impact us all.

Christine Mulhearn:

So, how do we put our money together and get the best bang for all that information? How are we going to work out how to have different trade partners, how to get the goods overseas in a different way and how to export those premium value products? How do we sell a pink over a yellow pineapple? growAG is another thing that I really wanted to talk about quite briefly. So, growAG is a website where you can look at all the letty funded research projects that happened across the country, and investors can find Australian partners. It's really important that we start to commercialise and bring forward some of the great research that we have. How do we put it into practice? How do we use it? Just not here in Australia, but how do we sell overseas?

Christine Mulhearn:

If you think about mining, which is a big part of the Australian landscape, mining in Australia is not just about the goods we get out of the ground. It's actually about the expertise in mining that we sell to the world. Lots of Australian companies sell their mining expertise about how to do it. Australian agriculture is some of the best of them all. So, where are we setting up how to sell our expertise to the rest of the world? And growAG helps us do that by partnering with different types of people to say, "This is the best that we can offer. This is the best way we can do something and here's how we're going to take it forward."

Christine Mulhearn:

And finally, the Hubs. The Hubs are really important. They contribute to that innovation agenda in saying, "Here is how we can accelerate that innovation. Here's how someone can experience innovation." Someone can come to a Hub and say, "I don't know how to do this," or, "I've heard about this thing and I want to try it." We can partner with people to say, "Actually, this is a piece of really interesting experience that we want to have and we think it would be great in South Australia, and we want to try it here." And the Hubs can really work together to make that end user adoption happen. And that's really it for me.

Andrew Bell:

Q&A time?

Christine Mulhearn:

Sure.

Andrew Bell:

For people out there, ask us your questions. I'm going to ask the obvious question. When are you going to be bringing the pink pineapple to this table?

Christine Mulhearn:

I am very excited about pink pineapples and I am looking for anyone who'd be willing to grow one with me. We're talking to a few different partners about, how can we get a pink pineapple here, and what are the obvious things that can happen? A pineapple worth $150 US in terms of an export market, we are much closer to Asia than Costa Rica is, so how do we change those barriers? How do we get a grower's mindset, a supply chain set mindset, to give it a go? It will be hard. We don't have the same soils. We don't have the same kind of tech, but how do we change our mindset?

Andrew Bell:

So, in the case of innovation, it strikes me that almost inspiration and innovation are two sides of the same coin. How do people get inspired? How do people recognise that something is almost hidden in plain sight, like the lentil flower, for example?

Christine Mulhearn:

So, that's where, in some ways, things like the Hubs are really important about showing people new ideas. It's about educating yourself. It's about trying to solve your problem. And for some people in some industries, the market's really good right now. So, there isn't that burning platform. There isn't that need to constantly change what we're doing. But it is really important. Things are going to be different. So, how do you future-proof your business if you're a grower? How do you future-proof your business as a supply chain? You look and you try different things. You might be having a really profitable season, as many people are, but how do you go on building resilience for the next drought or the next climate issue? I'm going to try something now. I'm going to move one field from carrots to something else. I'm going to try something different. It's about experimenting and thinking about, "Well, what if I just did?"

Andrew Bell:

And the balance between innovation on the one hand and resilience on the other. We've got a question come in anonymously. Who've you been consulting with when coming up with this agenda and also, what are the easiest ways to, I guess, spread the conversation? Because the more we talk, the more we think, and the more we come up with left-field ideas that could pay off.

Christine Mulhearn:

And the left-field ideas, the ones you absolutely want to hear about, we've been consulting pretty wildly across different parts. I've spoken to probably, I think a couple of dozen farming systems groups. I've spoken to all the RDCs. We've spoken to lots of different private sector investors. We're willing to talk to anyone. So, if you're really interested in having me come and see your farming system group or your growers group or your state government, absolutely get in touch with the department and we'll come and talk to you about it.

Andrew Bell:

The conversations, how formal do they need to be? How, if you like, controlled? Can you identify end games broadly and try and shape the conversation?

Christine Mulhearn:

Yeah, absolutely. Part of the development of the policy strategy is to look at some, what we call key themes, key missions, and they're really about signposts. So, how someone innovates will be different depending on what you produce and where you're at. But it's about we're all moving forward in the same direction. So, the idea of the policy statement is to identify about four key missions. We think about four. We're still working on them. So, here's the signpost at the end of the road. He's where you need to be. And how we all get there, we'll walk there together.

Andrew Bell:

Elizabeth Coonan's asking you, how do you build social, importantly, and environmental, importantly, resilience to support innovation and provide that inspiration in the context of climate change, the changing of the season and the increasing amount of extreme weather events?

Christine Mulhearn:

Yeah, absolutely. So, I think one of the things that we talk about a lot is social licence, if you think about the social licence for a good or a product. If you look at the recent free trade negotiations in the UK and the EU, people want to know where their goods are from. They want to know what happens. They want to know how it was grown, what you used to produce it, and what happened during the supply chain. And they don't just want to know. They want it proven. They want to be able to look at their phone and say, "This is the story of the grains that I grew. This is why it's important to me." And people will pay a premium for that. So, it's about being able to demonstrate the really great things that we do here and why we do them.

Andrew Bell:

Paul MacIntosh has been in the Q&A box. He's wanting a bit of a clarification from one of your remarks during your presentation. Are you indeed suggesting that we export our agricultural expertise overseas?

Christine Mulhearn:

Absolutely. One of the big things that we can do is we talk about growing agriculture to a hundred billion dollar business. It's not just about selling the goods and services that we produce. It's about being a service provider. It's about saying, "Here is the wonderful way we know best to grow and to adapt and to change." And we've done that through the drought. So, here's how we might sell that expertise to a different country who's going through similar or same challenges and help them build up their agriculture as well.

Andrew Bell:

Is that going to be, for some people, a bit of a, well, every pun intended, I guess, a hard sell? Because knowledge is sometimes kept close, isn't it?

Christine Mulhearn:

Absolutely. And you say this, "I know how to grow my particular product." Let's go back to pineapples. "I know how to grow pineapples. I grow them well. It's part of my way of doing business." Sure it is, but there's still a market out there for not just... We don't export pineapples. We only produce them domestically. Actually, that's not true. Last year, for a reason I'm still unclear about, we exported $12,000 of pineapples to Vanuatu. I'm very unclear about why and how, because Vanuatu grow their own, but we just have our own domestic supply. So, if we're going to look at doing things differently, it's about, well, someone else is going to grow their own domestic supply. Pineapples are really hard to transport overseas. Why don't we sell our expertise? We don't just have to sell our goods. We can sell how we do it. And that's a great export for us as well.

Andrew Bell:

Christine, thanks so much for joining us. Pineapples, lentils, trees and soil we've heard about in the last hour, rounding off our live presentations from here in Canberra. Thank you so much for joining us and thank you for all your questions. And they're being looked at and captured and all those things that we do. We're coming up very shortly to the Science Into Practice segment of this forum event. But before we go there, let's hear a little bit more about something that was mentioned on Tuesday on day one, which feels like a week and a half ago by now, and Ann Starasts CliMate video. Let's have a look at that.

Ann Starasts:

This presentation introduces Australian CliMate and describes how it is being used across Australia. I'd like to acknowledge the traditional owners of the land on which we gather. I'd like to pay my respects to elders past, present and emerging. Australian CliMate is a simple tool available for use on computer and mobile phone. It was developed for the Managing for Climate Variability program, and it's used in a range of industries to identify potential climate risks. It's facilitating discussion and planning in rural businesses. CliMate incorporates historical weather data for locations across Australia. It includes 10 tools, and today I will show you two and highlight how farmers and advisors are using them. Seasons Progress is used to monitor the current season and how it compares with past seasons. It is used to adjust cropping inputs or plan livestock management. How Often identifies the chance of rainfall and temperature and is used to identify the chance of sowing events, frost, or heat periods.

Ann Starasts:

CliMate can help estimate soil water and nitrogen, potential yield, identify drought conditions and identify the likelihood of receiving hot or cold temperatures. In this tool, you choose rainfall, temperature, radiation, or heat sun, and your location and timeframe. The graph shows historical data, median, and the current year's data. You can highlight any of the previous years to compare this season with it. The How Often tool can be used to identify, for example, how often rain above, say 20 millimetres, over a two day period occurs in a date, range and location. It also identifies consecutive maximum or minimum temperatures or solar radiation.

Ann Starasts:

CliMate has over 12,000 users across Australia. Farmers represent almost half of all users and advisors around 28%. Grains industry operators represent almost half of all users. Farmers are using CliMate for planning crop and livestock management and inputs, understanding the weather, exploring likely scenarios and developing management options ahead of time. Advisors are using CliMate to improve their skills, help explain what happened during the season, quantify risk and educate clients. 65% of user respondents to our evaluation indicated that using CliMate had led to positive outcomes. 47% of user respondents believe that using CliMate had improved their decision-making and advice. 33% of user respondents indicated that using CliMate had improved income. CliMate is used to facilitate discussions within farming businesses and families, and with advisors, around climate risks and management options. It has made it easier to access historical weather data and to quantify risk. Thank you.

Andrew Bell:

Everyone should CliMate. Thank you so much, Ann, for that presentation. Well, we've had a very busy morning here in the studio and it's been a busy morning of hearing information from our presentations here. We're going to take, shortly, a short break before we get into the Science Into Practice session, which will take us up to lunch/brunch time. So, nip out, do whatever you need to do wherever you are, perhaps even put the jug on, we'll be back very, very shortly.

Andrew Bell:

And hello again. Welcome back. Day three of the Future Drought Fund Science Into Practice Forum. And we're now going to talk for the next hour and a little bit about Science Into Practice, and Anwen Lovett is going to chair this particular part of the forum, which will be discussions covering a series of case studies with samples of work that turn Science Into Practice. So, over to you, Anwen.

Anwen Lovett:

All right. Thank you, and good morning, everyone. My name is Anwen Lovett and I'm the manager of the Climate Research Strategy for Primary Industries, which is bringing you this session today. CRSPI is a partnership of 17 organisations who are the rural research and development corporations, state, territory, and federal agencies, and the CSIRO. The CRSPI partners work together on climate adaptation and greenhouse gas mitigation research development and extension needs for the agricultural sector. Today, we're presenting three case studies which will give you a cross section from Northern Australia, 37 irrigation regions, about how research can actually feed into practice. Following the three case studies, we will be providing you with an introduction to the new Research and Development Corporation's climate initiative, along with a short session on the new Agricultural Innovations Australia.

Anwen Lovett:

So, without any further ado, I would like to move to our first case study, which is going to be presented today by Emily Corbett. Emily is a beef extension officer from the Queensland Department of Agriculture and Fisheries. She has worked for a number of years as a jillaroo on Northern Queensland cattle stations before starting a Bachelor of Agriculture at the University of New England. Emily is now two years into working as an extension officer, and she is based in , Far North Queensland. She works under the GrazingFutures project and the e-Beef project in Cape York and the Northern Gulf regions, and today she's going to be talking to us about Amber Station. Welcome, Emily.

Emily Corbett:

Thanks, Anwen, and thank you everyone for tuning in and listening to me today. I'm actually sitting in my car at the moment on my way out to the Northern Gulf so I hope that you can hear me okay and the scenery that you're looking at isn't too bad. Okay. So, yep, I'll be talking about Amber Station. So, just to start off with is a quote that I like. So, this says, "Effectively, change is almost impossible without industry-wide collaboration, cooperation, and consensus." So, with the influence of the management practises of Werrington Cattle Co., the Slaney's progress on Amber Station through property development, increasing carrying capacity and wet season phosphorous supplementation is an example of the next generation of young producers adopting practise change. So, this presentation will highlight changes made on Amber Station by new managers, Georgia and Dan. The Amber case study in which this presentation is derived from is a legacy document for GrazingFutures and DCAP.

Emily Corbett:

And these practise changes are key fundamental features of resilient and adaptable livestock businesses in the Far North, and I believe it's a good showcase of two of many forward and proactive young producers we have up here in the north that are working towards improving not only their businesses and the industry as a whole. So, this is Georgia and Dan. And Amber Station is a property that's just under half the size of the ACT, and it was recently purchased by Werrington Cattle Company. Historically, Amber Station operated as a low cost business operation. So, low cost, meaning that the property was fenced into only five large paddocks with half of the property open, but linked to laneways and holding squares around strategic dams and water points for the collection of cattle. So, steep gullies and rocky outcrops are used as natural boundaries on this place, and a number of neighbouring cattle on the property suggested that there was minimum stock control. There was no previous phosphorus supplementation program on Amber, and we would consider this property as a very high risk operation.

Emily Corbett:

So, at the takeover muster towards the end of 2019, Dan explained that, "Visually, the poor condition of the calves was a clear example of just how long the cows had been severely deficient. And as a result, they were all falling in a heap in the yards." So, cattle that are acutely deficient in phosphorus can result in cattle with broken backs, high calf mortality rates, poor conception rates and growing cattle with stunted skeletal growth and poor performance for the duration of their life. So, as mentioned in the case study, Werrington Cattle Co. has a long history of successful wet season phosphorous, dry supplement and wet season for the breed herds, so it was no surprise that the first management decision on Amber was to feed bulk bags of both wet and dry season supplements side by side.

Emily Corbett:

So, just a statement that I just want you to take in is that 2000 cows that were purchased with Amber consumed 22 tonnes of phosphorus supplement in just three weeks. Dan explained to me that he had never seen such high intakes of phosphorus. Sorry. I just have some light here. So, it's not new information that the majority of the Northern Australia is acutely deficient in phosphorus. Unlike the Northwest, the Northern dry tropics of Queensland does receive a guaranteed wet season every year over summer. The onset of this wet and the duration of this wet and how this rain falls and the intensity of it is what does vary. Although it's not exactly drought, this seasonal variation is definitely something that businesses need to be prepared for in terms of when we have bad years.

Emily Corbett:

So, maybe a short wet that came late and finished early and the rain didn't fall so great. So, wet season supplementation is often put in the too hard basket in a lot of properties up here. It's considered a bit of an extra cost in terms of supplementating during the good times, which is when they're all looking around, seeing a lot of green grass, as well as also the trial and error process of getting recipe suited to cattle in terms of palatability and meeting required intakes. Access to the properties during this wet season can also be quite challenging. So, this photo here is of Georgia and Dan's feed truck that they have out there. So, this issue of access on property is overcome by dropping off these half tonne bulk bags of supplements prior to the onset of the wet. If the wet season is prolonged, Dan will actually load up the helicopter with smaller 20 kilo bags and top up these supplement sites. This is an expensive exercise. However, it is a clear indication of the economic value that the Slaney's see in meeting these requirements of phosphorus intakes.

Emily Corbett:

So, we're looking at about 10 grams for a breeder and six grams for growing steers and heifers during the wet. So, yeah, phosphorous supplementation improves live weight gain, skeletal condition of the cattle, lactation and reproductive performance. So, Amber does receive on average about 800 millimetres over this summer period, and is fortunate enough to have several creeks branching off the Lynd river, which runs through Amber all year round. Along with a variety of native pastures, Amber has a lot of edible shrubs and a widespread Seca and other introduced stylos on their place. So, originally previous owners would have seeded stylos on this place. However, it is really common that wild horses can be the cause of a lot of widespread stylos on properties. So, stylos provide adequate protein and actually hold their greenness for a lot longer than our native pastures. They don't dry off as quickly. And previous research has shown that stylos can actually add an extra 40 kilos of live weight annually per head, depending on the season. Stylos are one of the most easiest and most productive options of pasture improvement in the Far North.

Emily Corbett:

Yeah, so just going on to the five-year plan here. So, Fred Chudleigh and I, an economist in DAF, took this opportunity of this takeover of Amber Station to capture the benefits of the improved management. The current property management plan developed by Georgia and Dan in conjunction with Werrington Cattle Co. focuses on implementing phosphorous in both wet and dry season supplementation; investing in yards, fences, and mortars to improve the carrying capacity and running efficiency of Amber; only breeders with better reproductive performance will be retained and herd bulls will be selected on an objective criteria that focuses on improving herd fertility, temperament and survivability. The majority of the Slaney's planning activities are heavily influenced by the successful management strategies of Georgia's family on Werrington Station. And the plan includes investment in additional fencing and property infrastructure. It will allow pasture spelling, a reduction in grazing pressure on parts of the property and care for native pastures.

Emily Corbett:

An expansion of the herd over the next decade will occur, and rebuilding of existing yards and cattle handling infrastructure will improve the staff safety and ease of livestock handling. Upgrading and adding to existing station roads will improve access throughout the property for a greater part of the year. So, even with access to a range of mentors and support mechanisms, the implementation of this five-year plan on Amber will rely very highly on a level of teamwork, skill and timeliness. So, on a recent visit to Amber Station of only two weeks ago, after the first round of mustering for 2021, the quality of the weaners in the yard was a telling sign of how this change in management has already had such a positive influence. So, Georgia's grandfather actually stood with us as we ran our eyes over the healthy young animals and quoted the reduction in calf and weaner mortality improved cow body condition scores, and an increase of pregnancy rates from 25% to 75% in just over a year.

Emily Corbett:

So, these three observations alone are key indicators and foundations of what we aim to improve throughout GrazingFutures. Dan Slaney went on to tell me that he would be mustering in the last of his bulls within the next week that he had missed in the first round. If you can think back to that first photo of my slide, this management practice of removing the bulls from the breeder herd reduces the joining period, prevents the out of season calving, and allows a period of two months where cows will not be lactating. I can't stress enough that retrieving 100% of these bulls on Amber Station alone is an astonishing effort considering the harsh country. So, with the combined practices of good supplementation, a number of new fences and dams already being implemented from the plan, I've no doubt that the determination of this young couple will shine through the performance of Amber Station as part of Werrington Cattle Co., and I'll look forward to reviewing this case study in the next four years.

Emily Corbett:

So, I just wanted to note that I know that I've mentioned a lot about individual changes that have been made on Amber. However, these efforts combined present the evidence that a prepared and resilient beef business in the north dry tropics is possible. And the turnaround in production and profitability of Amber Station in just over a year is what I believe the practical representation of what GrazingFutures and DCAP actually stands for. So, if you have any further questions, please jot down my details that are here on this slide. The case study itself, if you haven't had a look at it yet, it's available on the FutureBeef website at that URL just there. And that is about it for me, and I'm going to stop sharing my screen now.

Anwen Lovett:

Great. Thank you for that, Emily. And I have a question for you, which is about how do you know each animal is getting the right phosphorous dosage given you've got things like shy feeders among cattle herds?

Emily Corbett:

Yeah. So, you can't necessarily, especially on such a large scale property, you can't necessarily guarantee that each animal is getting that, but they do take note on how much supplement or how many breeders they have in that paddock, how much supplement they're putting out. And you can sort of work it back by how many head you have in there and make sure that they're roughly receiving that 10 grammes per day into when you're next hoping to fill up that supplementation.

Anwen Lovett:

Okay. All right, Emily, that's the only question that's come through the chat. So, thanks so much for joining us today and multitasking from the car. It's actually worked pretty well.

Emily Corbett:

Sorry about that.

Anwen Lovett:

We'll let you go and I'm going to move us on to our second case study this morning, which is being presented by Mark Skewes. Mark joined the South Australian Department of Agriculture in 1986, and he currently works for the South Australian Research and Development Institute. Mark has many years experience in all aspects of irrigated crop management, including irrigation scheduling and soil and plant monitoring. He has conducted research trials in a range of horticultural crops, ranging from industrial hemp through to almonds, and today the focus of the project that he's going to talk about is on almonds. So, thank you and welcome, Mark.

Mark Skewes:

Thank you. So, the project that I'm going to be talking about was funded by Hort Innovation and the Almond Board of Australia, and it was looking to investigate irrigation system performance in the almond industry. And the photo that you're looking at is actually a screenshot from a video that was produced as part of this project. So, the outline of the project was to determine best practice for almond irrigation. And the primary focus was on drip irrigation because that's, at this point in time, the primary irrigation system used by the industry. There was an aim to develop almond grower irrigation best practice management guide and associated tools and resources. There was a desire to increase the capacity of Australian almond growers to adopt best practice irrigation management and to equip almond growers with a resource that could be used to train best practice irrigation management on the farm. So, fairly wide ranging objectives.

Mark Skewes:

I guess the first activity that was undertaken was an on-farm irrigation audit. So, 50 almond blocks were assessed for irrigation system performance. We measured emitter pressures, emitter flows, the flow rate of a complete lateral. There was a questionnaire to look at some background information from the growers.

Mark Skewes:

Now, just to explain what we were doing and show how that works. This is an irrigation valve unit, so down at the bottom is the valve where the water comes in and it's distributed across the valve unit, there are trees all through that area. The principle of irrigation systems is to try to apply water as evenly across that area as possible, in this case a patch of almond trees, and we can test how evenly that's happening by taking measurements at key points within the system. So, we're looking for a few things, we're looking at close to and far away from the valve down the sub-main, because there's going to be loss in pressure normally down that sub-main. We're also looking at close to and far away from the sub-main along the laterals because, again, there'll be pressure loss along those laterals. And the other thing that we're going to be looking at is high and low points within the general system, or the lay of the land, because high points will tend to result in lower pressure and low points will have increased pressure.

Mark Skewes:

And that pressure can then influence the flow rate of the drippers. And then another thing that we did in this particular project as a bit of a cross-check was to measure the flow in a complete lateral, and by knowing the flow rates of the drippers, or the nominal flow rate of the drippers, on that lateral than knowing the number of drippers we can estimate what the flow rate should be for the complete lateral. And then we can measure that and compare the two.

Mark Skewes:

So, in terms of that performance audit we looked at 50 irrigation systems on individual properties. Two systems were assessed in the Northern Adelaide Plains, which is a small part of the Australian industry. The majority, 21 in the Riverland and 22 in the Sunraysia, and then five in the Riverina. And the seven in Lindsay Point we call Riverland even though they're actually technically in Victoria, but just across the border and really part of the Riverland industry.

Mark Skewes:

The results of the project, and some tools and information to meet the objectives of the project were then built into a website, and that's hosted by the Almond Board of Australia on their webpage. There's a direct URL here on the screen, so irrigation.australianalmonds.com.au, Or it can be accessed through a link on the Almond Board's website. This is the homepage of that website, and so at the top there there's a video which introduces the project and there's a bit of information about the results of the industry audit in that video, but down at the bottom are the buttons that take you to other parts of the web page.

Mark Skewes:

So, the first button takes us to a summary of results. So, I'll just run through a very small part of the results, and particularly in this case I'm going to look at variation in flow from individual drippers. Now, the variation in flow shown in this graph is between the highest and lowest readings taken within a particular valve unit, and their variation from the midpoint. So, we talk about plus or minus, and the standard is plus or minus 5%, which is represented by the orange line. And we're looking for performance below that line, so less than, plus or minus 5% variation in flow rate in the drippers. And you can see here that, by far, the majority of sites are performing outside of that standard. Just to note that the yellow bars there represent non-pressure compensating drip systems, and the blue bars represent pressure compensating drip systems.

Mark Skewes:

The pressure compensating systems simply means that within a wide range of pressures the flow rate shouldn't be changing very much. So, the fact that there's that much variation is a concern, and it means those systems aren't performing as they are designed to. And it's likely that there's some blockage issues happening with individual drippers to cause those high and low flow rates in individual drippers. Interestingly, if we compare coefficient of uniformity of the drippers, we say that here the standard is 90% or better. And this is really just looking at the variation of all the measurements taken around the average, and we're finding here that there's a lot less variation if we look at it in that sense, and a lot more of the sites are performing well.

Mark Skewes:

And that, again, underlines that it's probably one or two drippers within what we've measured within the system that are performing outside of that expectation, so too high or too low. Because blockages tend to occur at the extremities, at the the last dripper on the lateral, that's why we need to be measuring out to the extremes, out to the ends of the system, not just measuring in the middle.

Mark Skewes:

Another measure is flow variation from design or nominal flow. And so, again, with a pressure compensating system that should be flowing at the nominal value within a wide range of pressure, the fact that we've got a few sites here that are quite a long way outside of the nominal, in most cases higher is cause for concern. The reason for that is likely to be partial blockage of drippers, and with the pressure compensating drippers which have a diaphragm in them which moderates the flow as the pressure increases. If you get partial blockage and get material under that diaphragm, it can block it open so that the flow rate just keeps increasing, the diaphragm can't do its work. And so that is likely to be one of the reasons for that variation in performance.

Mark Skewes:

We also looked for correlations in performance with other factors drawn out of the information we collected with the questionnaire. So, here we have flow rate, or variation in flow, sorry, by dripper installation date, so age of the system. And while there's a lot of scatter there, there is a general relationship that says, "As the system gets older it's less likely to perform well, or more likely to perform poorly." But, as you can see, there are some systems that are 15 years old that are still performing quite well, and there are some systems that are less than five years old that are not performing well at all. So, it does depend on the quality of the water being pumped, the filtration and whether that's adequate for the water quality and the problems that come with that water, that can affect how a system ages and how quickly it ages.

Mark Skewes:

Another correlation that we looked at was with flushing. So, this is where the system is opened up a part of the time and water is flushed out, and washes out silt and algae and other material that collects in the system, just to get it out of the system because otherwise the only way for it to come out is through the drippers and that causes blockages. So, while there's quite a bit of variation in performance at the low end of this graph, we had a couple of sites where there was what some people would call excessive flushing going on, 20 and 25 times per year but those systems were actually performing very well, and probably indicates that a lot of the industry is not flushing often enough. It's a time-consuming manual job and so tends not to get done, but this would suggest that there's benefits from doing it more often.

Mark Skewes:

Coming back to the home page, probably the key component of this webpage and key output of the project is the drip irrigation evaluation tool. What this allows you to do is to actually assess your own system. So, here on this page there's a video at the top, which outlines how to collect the information needed to assess an irrigation systems performance, and then by going into the check your performance area you can actually enter your data and do that analysis. So, this sheet allows you to put in the basic background information about your system, the red areas there are mandatory, the other information you can provide, but it's not required for the assessment. And then there's a table to put in the actual measurements taken in the field.

Mark Skewes:

If you enter that information and you press the submit data button, and the tool will calculate the performance of your system against a range of indicators. And I've talked about a couple of them already today, but there's more in the system. So, here we have some dials and colour indications to identify the performance of the system against the different indicators. At The top we have one site and below we have another site from the same farm, so you can compare your own performance between different valve units on the farm, or maybe a before and after when you've done some maintenance work, see how that improves the performance. And then there's some information, some texts there that I guess helps to identify how bad the situation is and what might be contributing to that. Why you might be having issues, and give people a bit of an idea of where to look for information to improve their performance.

Mark Skewes:

Also on that page is graphs, which show performance of your site or sites against the 50 sites that were assessed in the original industry audit. So, here we have our two sites and the 50 sites in the audit, and we can see how well were we going compared to the rest of the industry. And I guess in this case, not too badly, but we could do better. Back on the home page, the final button here is information and resources. And here is where once you've done an audit of your own performance, of your own blocks, you can look for assistance with identifying what the issues are, how to address them, what resources might be available.

Mark Skewes:

So, there's a page with documents and there's some PDFs and website links there, some with irrigation companies, some with state departments that have information available. There're also some videos, and some of these are from overseas, as well as Australia, and, again, companies and government departments. An, again, showing how to measure, how to treat systems and how to maintain them, and just a good background information to help people to get their head around how their system is performing and what they might be able to do to improve that performance. And, finally, there are links to the project partners and all of these groups and companies had input into the project.

Mark Skewes:

So, that website has been live and available to the industry since September, 2020. And in that time we've had, I think, pretty pleasing activity on the website. So, this is monthly visits to the website, in the red red bars number of visits, and then the number of unique visitors in blue. And so, every month, since September, we've had at least 60 individual visits to the site and that's been at least 40 different individuals visiting the site and having a look around. And, of course, obviously some people coming back a second time within the month to have a look.

Mark Skewes:

So, there is good activity on the site, there's people coming and looking at the information, looking at the results, understanding what the project is all about. Hopefully clicking on some of those links to information. In terms of the irrigation evaluation tool, so in the original project we audited 50 almond blocks. In terms of self audits, since that went live in September there's been another 50 blocks added to the database, so 50 individual almond blocks that have been assessed and entered, and the results have gone back to the owners, and that's on 36 different properties. So, again, some people who are doing more than one site on their property, but 36 different properties where there's been activity in evaluating the irrigation system performance.

Mark Skewes:

Finally, I'd just like to acknowledge the partners in this project. Jeremy, Maxine and Peter from Ag Victoria and Netafim, who helped with a lot of the field work. A couple of my colleagues here, Mickey and Kavitha who did, again, help with the field work. And Josh Fielke from the Almond Board who helped to identify the sites to do the work, and also did all the filming of the videos, and helped out with the project generally. Thank you very much.

Anwen Lovett:

Great. Thank you, Mark. And we'll keep you on line, Mark, because I've got a couple of questions for you. So, the first question is from the shine dome, "Firstly, thank you for a great presentation. In your field, what do you think the distinction is between good practice and best practice?"

Mark Skewes:

I guess in terms of irrigation system performance there are standards, the plus or minus 5% variation greater than 90% coefficient of uniformity, those are good practice. Best practice is probably more related to then scheduling irrigation to get the most out of the water applied, getting it on at the right time in the right amounts and so on. There's only so much you can do with system performance, having a well-designed system, installing it as per the design, making sure that it's maintained to maintain the performance levels that it should have, but best practise is how you then use that system to apply water efficiently. And obviously if the system is not performing well, if there's more water going in some parts of the orchard than others, then that's not best practice, but having that part in place doesn't also then necessarily mean best practice. Does that make sense?

Anwen Lovett:

Thank you, Mark. And I have another question from Narelle Hill who asks, "How do you see the outcomes and lessons from your project applying to other sectors, and have you started reaching out to form any collaborations?"

Mark Skewes:

In terms of the second part, no, but I guess in terms of other industries and the other use of the principles, the idea that we had was to audit the industry and get an idea of what was going on, and then allow people to benchmark themselves against that, was one of the principles. And that's something I've been involved with in otherwise in the past, and this is just another way of doing it. So, benchmarking is certainly, I think, a really useful tool however that's rolled out. In this case, it happens to be a hands-off remote way of doing it, and that's efficient in use of resources, but it's going to how you do that is going to vary according to the industry and what it is that you're actually trying to benchmark against as well. In this case, it's only irrigation system performance, there are other things that you can benchmark, obviously.

Anwen Lovett:

Thank you, Mark. And I have one more for you from Julia McKay who asks, "Could the flushing be done remotely with some tech device?"

Mark Skewes:

Yes, it could but nothing beats actually being there and seeing the dirty water come out and making sure that you get the first flush, and then you get some clean water and then you get a second flush of the dirty water coming out. And so, generally speaking, it is ideal to be there to open up very few laterals at a time, so maybe a half a dozen at a time. Watch them, make sure that they do run clean the second time. There are flushing sub-mains that have been used to link up more than one lateral and make it a bit easy to do still on site. But, again, that's not necessarily the most efficient way to do it, so it's one of those things. Yes, it can be automated and could be done remotely, but to get the best results there's nothing quite like being on hand and doing it yourself.

Anwen Lovett:

Great. So, Mark, that's all the questions that have come through. Thanks so much for your presentation today, we'll let you go and move us onto our third case study.

Mark Skewes:

Thank you.

Anwen Lovett:

The third case study today is actually prerecorded and is being presented by Allen Benter and Jess Fearnley from New South Wales DPI. Having said that, Jess is on the line so she's available to take your questions, so please start putting them in to the chat as you listen to the video. The presentation today is on the Climate-Smart Pilots project, which is part of the DPI's climate change research strategy. It is aimed at demonstrating the role of digital technologies as an adaptation for climate change, including drought. Allen, who is the leader of the project, and Jess is the lead on the horticulture pilot which is being presented today. Thanks, if we can start the video.

Allen Benter:

So, the project that Jessica and I were going to talk about today is Climate-Smart Pilots, and we're running these pilots across a number of industries but we'll focus today on horticulture. And in these pilots we're really looking at how we can adopt digital technology as a way of adapting to climate change, and increasing climate variability. The Climate-Smart Pilots projects are really looking at how we can deploy on ground and have commercial demonstrations of different technologies that can provide a more complete and close to real-time information about production changes related to climate variability. So, in most cases, across our pilot farms, we're deploying commercial off-the-shelf systems that farmers could easily deploy themselves. So, that includes temperature loggers, is in the bottom left, water monitoring through the middle, and on the far right even solidity buoys add in estree systems.

Allen Benter:

In some cases we're developing our own software, and where there are particular market failures or there's no feasible solution for growers we're developing our own hardware to be able to collect the required information. We have pilots running down and fisheries industries down at Clyde river where, for oyster growers where giving them simple tools to be able to manage climate variability, particularly heat waves, which can devastate an oyster crop in an afternoon. But, more importantly, we're giving them a set of tools that will allow them to better understand what's actually going on across their production environment, and help them to develop better management techniques into the future to reduce those losses.

Allen Benter:

In the livestock space our growers indicated that drought and water management was their number one priority. And, in particular, that was around ensuring that there was water available for livestock, and so better monitoring of animal welfare. But a key part of our project is also around looking at different grazing management techniques that might respond better to climate variability. In the horticulture space water, again, was one of the key drivers and, in particular, how we can improve water efficiency by using new digital tools. Also given the scope of orchards, looking at how we can better understand what's actually going on within the local climate and how that climate change might be impacting production, but also looking at new and innovative ways to really drive better production and efficiencies across the orchard space. All of these pilots, one of our key parts within our project team is to bring in specialists who actually work within each of those industries. So, For horticulture Jess Fearnley has joined our team and she's going present on the work that we're carrying out in that pilot.

Jessica Fearnley:

Thanks Allen. So, today I just wanted to give a bit of a rundown of horticulture in Orange and why that industry is so valuable in this area. A little bit of why the drought in 2019 and 2020 was so detrimental to the orchards of this area, and then how we're using technology to adapt to the change in climate. So, how are these growers going to utilise technology for future droughts and a future change in climate?

Jessica Fearnley:

So, the horticulture industry in Orange is quite prevalent., and this is because Orange some of the most productive soils in the world. And this is due to the extinct volcano, Mt Canobolas, which was active previously and it has created some beautiful fertile soils with really high water-holding capacity, and very good structural integrity. So, the horticulture perennial crops thrive in this environment. Orange has one of the best climates for producing temperate fruits because it has a cool winter and a mild summer, and it also is a high rainfall area. So, these horticultural crops are able to get the water when they need it the most and thrive in the nice, cool conditions in winter, and a bask in warm conditions in the summer.

Jessica Fearnley:

We have many horticultural crops in Orange, including wine grapes, apples, cherries, and stonefruit. So, it's very diverse and a really lovely place to live, actually. One of the larger orchards in Orange is Stoneleigh orchard, and it's a family run farm with crew and Ian Pierce heading it up. Ian is our focus farmer for the pilot and he is very innovative and is looking for ways that he could continue to produce quality fruit into a changing environment, and how he can use technology to help him do that. So, Stoneleigh s located in Orange and it is a cherry and apple farm, and it supplies both the domestic and international markets. So, Ian's trying to get that really high quality fruit to be put onto the international shelves and continue that production well into the future.

Jessica Fearnley:

The 2019, 2020 drought was an extremely tough time for the growers in the Orange area. At one stage there during the season there was a 100% of New South Wales being drought declared, so it was very severe across the whole of New South Wales. Water storage for the orchards was extremely low during this time, and this was because the years leading up to this season, there was less and less water. It was getting increasingly warmer, so the storage is that they usually bank on to start the seasons just wasn't there, so they we're starting on the back foot before they ever got into the growing season. There was widespread sacrifices of not only the Aquila Cherry blocks within the region, but also the other horticultural vineyards around the area, which means growers were just walking away from trees with no choice but to leave them without water.

Jessica Fearnley:

And, as I mentioned, Orange is traditionally a high rainfall area so growers would only use irrigation traditionally as a supplement to the natural rainfall, but as the climate's changing and the rain is falling at different times through the year, growers are now looking to be fully irrigated. They haven't been in this position before, so they haven't had water management tools to be able to deal with this change in rainfall patterns. So, they're stuck without water management tools.

Jessica Fearnley:

So, the drought at Stoneleigh did have a particular effect as well. Water storage had run out after the cherry seasons, so there was a particular focus on getting that export crop through. And then when apples started there was very limited water, and Ian actually ran out during that apple season. So, older trees and less productive blocks were sacrificed, so the water was cut off and utilised onto more productive blocks. Mulch was applied to minimise water loss, however, this still caused small trees to be severely affected as Ian didn't have the tools, at the time, to be able to monitor how much water was going on, how the water was being utilised by the trees, and what were the actual effects of walking away from these blocks had on the tree physiology.

Jessica Fearnley:

Now, he does because we've implemented our pilot onto Ian's property and that's going to enable him to have more control and monitoring over his natural resources, such as water and the temperatures, and climate that he's experiencing at Stoneleigh. So, we've put out a digital weather station, which records rainfall, temperature, humidity. We've got in-canopy sensors, which is really handy for Ian's block because he has various elevations throughout his orchard. So, we have different micro-climates that he's experiencing, so he's able to really block manage rather than orchard manage, and really get that in-depth monitoring that he needs for each block.

Jessica Fearnley:

We have an irrigation flow metre, tape monitoring sensors, soil moisture probes and automatic irrigation valves, which are all providing him with the ability to monitor down to those small rose blocks, which is really handy for him. And all of these are running on a LoRaWAN network, so he's able to look at these different sensors on his phone, or his tablet, or his computer, up at his office, in the truck. So, it's very accessible for him at all times.

Jessica Fearnley:

As I said, we've got a range of weather and temperature monitoring, in the left-hand side we have the apples 41, which we've got deployed out in the middle of Ian's orchard. So, it's in a nice open area in the middle of the farm so he could get really accurate temperature, humidity, and rainfall off that device. We've also, in the right-hand corner, got the temperature and humidity canopy sensor, which is deployed right up in the canopy. We have four of these deployed at different blocks, so he's able to get monitoring and temperature data off each specific block. And all these sensors are connected to a dashboard and we're generating these types of graphs and widgets, and infographics that then he can look up and look at real-time data and see what's happening on his orchard right now. And we're generating data that is enabling Ian to be able to get a more accurate view of what's happening on his orchard.

Jessica Fearnley:

So apple and cherry growers use a tool portion calculator. And this tool portion calculator is really important to know when a tree is going to break dormancy. So temperate fruits will accumulate what are called chill portions, which is a time spent under a certain temperature over winter, which then allows them to basically set fruit in the spring time. So this is really important for growers to know when they're going to apply chemicals for thinning, or when they are going to actually harvest their crop, and organise labour around this.

Jessica Fearnley:

What growers would traditionally do, is use the BOM website at Orange Airport, which is approximately 15 kilometres away from Ian's orchard. So very variable. And now with our ATMOS 41, or our canopy sensors, Ian's able to use more accurate data.

Jessica Fearnley:

And as you can see the difference between the BOM website and Ian's orchard, is actually about a week, or two weeks in some instances. So he's getting more accurate data which he's able to make those better management decisions and organise his orchard, and a lot more efficiently than what he was before.

Jessica Fearnley:

The most important pieces of technology that we have out at Stoneleigh, is the soil moisture probe. And this is because water is one of the most important resources to an orchardist. So we've deployed several multi-depth probes. And the multi-depth allows for monitoring down the profile, which is really important in a horticultural crop, because you have roots of the system from that 10 centimetres all the way down to even 80 centimetres.

Jessica Fearnley:

And so, this is allowing for better irrigation management and improved water efficiency, because we know where the water is sitting within the profile. And this became more apparent to us how important the soil moisture probes were in the drought. At the time during the drought, Ian had two sets of irrigation equipment. So we had micro-sprays and drip irrigation.

Jessica Fearnley:

And he was trying to work out what one, the better one was for him. So it's grand old debate within new South Wales growers, is what kind of irrigation system is best? And what Ian did was, he had a quick look at our soil moisture graphs that we were generating for him. So on the top left right-hand side, we've got a graph looking at East trellis, and then below that we've got a graph looking at Johnson's corner.

Jessica Fearnley:

In East trellis, he had the micro-spray drippers installed in this block, and on Johnson's corner, he had the dripper sprays. Now as you can see, between the two green lines, there's a definite deficit in water, going down the profile in the East trellis. Both of these blocks were being watered the exact same amount.

Jessica Fearnley:

But as you can see, Johnson's corner, it was reaching down to almost 60 centimetres, the water, whereas in East trellis, it wasn't even getting below the 30 centimetre mark. So as you can see, there's a definite difference between micro-spray and drip irrigation. So when Ian saw this, he decided that he would switch his East trellis block over to drip irrigation.

Jessica Fearnley:

And as you can see, after that second green line there, he started getting readings way down the profile with water. So the drip irrigation definitely did make a difference, but unfortunately it was a little bit too late. And as you can see, both irrigation start to taper off, indicating that's when Ian turned off his blocks and ran out of water.

Jessica Fearnley:

When we approached some growers about the different types of data that they get generated off different technologies, the stark thing that came back to us was, there are a million different technologies out there that I can buy, but how do I interpret the data?

Jessica Fearnley:

And that's one of the problems that we're focusing on as part of this pilot, is how are we getting our data from these technologies in a usable, readable format for growers? So on the left hand side here, we're playing around with a couple of different graphs.

Jessica Fearnley:

This one is looking at the plan available water, and where the irrigation is sitting within that, in between permanent wilting point and our field capacity. And then on the right hand side, we're looking at a graph that compares the moisture in the ground right now to historical values, and whether that's wetter, so with the blue, or whether it's dryer, the red.

Jessica Fearnley:

So we're trying to play around and work with growers and get them to try and tell us, what way works for you, and what do you want to see? Do you want to see the historical data and compare it, or do you want to see real time, what's happening now?

Jessica Fearnley:

In the hope of our water monitoring tranquillity, we really want to set up a automatic irrigation. So we've deployed some automatic valves that Ian can use at his office. Which is him in his office on the left-hand side there. And he can sit and schedule irrigation, and open valves from his desk, and really get more control over his irrigation.

Jessica Fearnley:

Because irrigation is actually one of the most time-consuming task. To going around turning all the pumps on, and making sure the valves are all open. And now this gives Ian the option to be able to irrigate not only from his office, but also at times of the day where it might be more, water efficient.

Jessica Fearnley:

So generally you would water during the day, because that's when all your staff are on to turn the pumps. But now Ian might be able to irrigate at night, where he's not losing as much water to the evaporation. And therefore making his business a bit more water efficient, which is really exciting for him. Now I'll just pass back over to Allen, to talk about how we're driving adoption.

Allen Benter:

Thanks, Jess. Growers face a number of barriers to adopting this type of technology, nonetheless being costs and the time to actually implement the deployment and also monitoring and maintenance of the equipment. But really these pilots that we're deploying out on commercial farms, really are looking at the value proposition and how we can demonstrate to growers... How these technologies can really help them and where it can save them money and stress.

Allen Benter:

One of the barriers is also digital literacy. A lot of the growers are just not really aware of what they need to do or what is possible for them, and even where they might start. But as we've seen through a lot of our field days and where we've engaged directly with a range of growers, there's a real uncertainty around how to actually use the data, and what it means for them.

Allen Benter:

And a key one there, is around who to trust, whether it's a commercial organisation that's out there trying to sell them a product, or understand different technologies and which one might be better suited to them? Through our program, the Climate-Smart Pilot project, we're actually demonstrating these solutions with commercial farmers.

Allen Benter:

So it's really important for us to have Ian's voice stand up in front of a group of growers and talk about, not only the benefits and the opportunities that's available to him now through these digital tech, but equally some of the problems he's experienced and how we've overcome this.

Allen Benter:

Our pilots operate as an independent trial. So there's no commercial imperative to this. We're actually looking at, how we can provide the best solutions and demonstrate that they are actually viable. And particularly there, but taking the objective data that we're getting and driving decisions on farms.

Allen Benter:

One of the things we're finding really, is that it's about giving growers confidence. So not only confidence in the technology, that when they deploy this type of digital tech, they're actually getting something that is viable and valuable to them, but also gives them certainty across their operations. As Jess has pointed out, they're able to see down at a much, much finer level, just what's actually happening across their operations.

Allen Benter:

And often what comes back is that, the data say with Ian making changes to his irrigation systems, it gives him confidence in those decisions by having that objective data. The quote on the right there from one of their livestock producers, really it was about over that summer drought and the heatwaves. Just being able to get away and have some downtime over Christmas, and actually relieve some stresses from being on farm through very difficult times in the drought.

Allen Benter:

The key people in our team, obviously we've got a fairly small Climate-Smart Pilots team that's driving a lot of the deployment and the development of this spaces. But really our key partners in this through horticulture, livestock and fisheries, are our farmers. And we're really pleased to have them on board.

Allen Benter:

If you would like any further information, there's a couple of links to websites there, including the Farm Decisions Tech website, but please get in touch with either myself, or Jess, if we can help. Thank you.

Anwen Lovett:

Thank you for the video presentation. Now both Allen and Jess, have joined us to answer your questions. We have some questions on the chat. If you have any more, please post them now.

Anwen Lovett:

The first question is from Tony Kennedy, and he asks, in terms of fisheries, what is the impact of human-induced contaminants like plastics, especially micro plastics and excess fertiliser and top soil runoff? Who'd like to have a go at that?

Allen Benter:

Yeah. Thanks, Anwen. Thanks for the question, Tony. We don't directly record or measure any contaminants across that network. We do have within the Esri system, our extensive network of salinity sensors. And one of the things we have seen as a direct impact, is the immediate runoff from residential areas.

Allen Benter:

So we can see in our network, for instance, that the... In a rain event, we're not just looking at what's happening upstream and the impacts from that, that we're really getting very immediate effects close to the water runoff from those residential areas. And that has a dramatic impact upon the grower's ability to harvest and for us to be able to predict when that might happen.

Anwen Lovett:

Okay. Thanks, Allen. The next question is from Wesley Wood, who asks, how good is the mobile coverage around the orchard?

Allen Benter:

That's one for you, Jess.

Jessica Fearnley:

The team went around and... I think they call it an oyster, or... I'm not quite familiar with the term. But we went around and double-checked that everywhere on the orchard was able to get good coverage. Currently, Ian does have good internet coverage on his site. It is quite a hilly orchard. So there are some parts of the orchard that we do have a little bit of trouble with, with signal.

Jessica Fearnley:

But most of the blocks do have one point where we can connect up, and we haven't had any issues as of yet with signal noise or anything like that. We did deploy a RoN gateway on top of Ian's shed, which does have really good coverage across the whole orchard. But it does impact if you do have very hilly environment, that you can lose out on some of the signal.

Anwen Lovett:

All right. Thank you, Jess. And one more question from Ben Curry, who asks, how did you choose your pilot farm locations and how many were/are there?

Allen Benter:

The majority of our pilot farms were chosen because the farmers were already engaged with DPI in other projects. And so we already had a really good relationship with those growers personally. So within our horticulture space at the moment, we've got Stoneleigh that Jess has just presented about, and we're just preparing another set of pilots down in Griffith, in viticulture.

Allen Benter:

For the livestock, we've got two or three pilots going there. One of those we had running and the grower saw some really immediate results from the technology deployment, and basically went out and replaced it with a much more extensive and fully commercial system. So they're still certainly engaged in the project. It's just that we're not delivering that service to them just at the present.

Allen Benter:

With the fisheries pilot, that's really only one space at the moment, but because it's covering an estuary system, we actually have about 12 or 13 growers in that estuary system that are using the pilot, out of a total of about 24 growers down on Bateman's Bay. It's a smaller number of sites, but we have quite a lot of individual farmers engaged.

Jessica Fearnley:

Just on the horticulture pilot as well. We needed a grower that was going to allow us to have onsite demonstrations and field days. And so, when we're choosing our pilots where we're going to have these technologies, we really want the farmer to be able to engage with the other growers.

Jessica Fearnley:

And so, Ian was the perfect choice because he is very readily involved in the community and one of the more progressive growers in their district. So it was an easy choice for us to choose Ian. And he's more than happy to come on board as well, which is really handy for us.

Anwen Lovett:

Okay. Thanks, Jess. And another question has come through from John Reeve, asking, what funding alternatives are available for scale up for producers, given you mentioned time, cost, maintenance, of new practice and tech?

Allen Benter:

One of the key ones that's coming forward is, New South Wales government has just announced a large farms of The Future Project across... I think it's five regions of New South Wales. And that's, I guess, in a similar vein to what's already running through Victoria, and I think in Queensland as well.

Allen Benter:

So there are a number of programs coming through. The details of the New South Wales program hasn't been released as yet, but that's all up a $48 million program looking at technology on farm, and really driving adoption of that technology piece.

Anwen Lovett:

Another question has just come through from Catherine Evans. Who's asking, if there is adoption, do you expect this adoption, once the growers have learned the rule of thumb, from viewing the observations, and if so, which measures? Maybe one for you, Jess.

Jessica Fearnley:

I think once growers have the tools, they're able to keep progressing with them. And I think once they understand, protect the soil moisture probes, for example. Once they have that data at their fingertips, they'll be on there every single day, looking at their water. And if we can convert it to cost and labour efficiency, they're going to use it more.

Jessica Fearnley:

So I don't think once they've learned how to use the technologies and get a feel for what they do and a feel for the climate, I don't see them disregarding the technology, unless it doesn't fulfil what they would like it to do. And that's particularly a strong part of our project, is trying to get our data in a usable format that looks at the historical values and current values to the growers, more informed, and they can keep using it and well into the future.

Jessica Fearnley:

And I think, one of the main aims of the pilot is to become more resilient to changing climate. The change in climate will continue to change. So I think that with the technology that growers would just use it more and more, which is exciting. And it's an exciting tool. Like I said, they don't generally have many water monitoring tools at their fingertips. They saw moisture probes providing them with excellent data. It is exciting that they are taking it up.

Anwen Lovett:

Okay. Thanks, Jess. Allen and Jess, I can't let you go yet. We've got another question. So thanks very much to the audience. Keep the questions flowing. We do have a spare few minutes at the moment.

Anwen Lovett:

So Carolyn Welsh, she's asking, did you consult with dry growing regions who had already adopted such irrigation technologies? And she's referring to the new hubs, and could they be a future benefit in terms of the linkages in the learning between the regions?

Allen Benter:

For irrigation in dry growing regions, I guess our pilots down in Griffith, again, they've start to look into some of that. And that's really driven all around better water efficiency. Certainly our livestock pilot, we've got one out at Tullamore, central New South Wales, where again, water is a key issue for them. And I think really that's...

Allen Benter:

Given that, that our project started in early 2019, and went through an extremely dry 2019, early 2020 period. That was the major concern of all of our growers, including our fisheries teams, was around drought and the impacts of drought and how to manage water efficiency.

Anwen Lovett:

Great. Thanks so much, Allen. And there's a last minute question from Annabelle Fife, who asks, how can you become a pilot farm and what's the process to register your interest?

Allen Benter:

These essentially pilots, and there're a limited number of sites that we're running. Because we're actually managing them all. But the information that we're gathering and the data that we're collecting is all being made public and available through our website.

Allen Benter:

In terms of that broader New South Wales Farms of the Future program, that's been announced, there'll be more details coming out in the next few months. And so farmers across New South Wales will have an opportunity to engage in that broader delivery piece.

Jessica Fearnley:

And on that, if you're interested in any of the technologies or any of our data, just get in touch with myself or Allen, and we can point you in the right direction. Happy to chat to anyone that's interested, particularly in the horticulture space.

Anwen Lovett:

All right. So thank you so much, Jess and Allen, that's the end of the questions. And thank you so much to the audience for sharing those. It always adds a lot of interest if we can have a discussion after each.

Anwen Lovett:

So I'm going to let Jess and Allen go, and I'm going to move us on to the next part of the session. So we've completed our three case studies, which I think you would all agree, are powerful examples of science to practice and how applied research really can help our farmers as they adapt and respond to our changing climate and to droughts.

Anwen Lovett:

Now we're moving on to a presentation by Matt Barwick. Matt is a research portfolio manager with the Fisheries Research and Development Corporation. And he's going to talk to us about the new RDCs Climate Initiative. Matt was a member of the working group, who's been developing up this initiative for about the last 18 months, and he's going to share that with us. So thank you, Matt.

Matt Barwick:

Yeah. Thanks very much. Good evening, I'm lovely to be here to speak with you today about this initiative. I speak today on behalf of a large working group of people across diverse research and development corporations. Our reference group that comprises grassroots fishers, farmers, and foresters, that have helped contribute to that process. And a really capable group of innovation facilitators that have helped us in the process that I'll be taking you through.

Matt Barwick:

Just want to make clear that the broadened collaborative team that have got us to the point that we are right now. In the short time that I've got with you today, I want to take you through the following areas. A bit of a summary of what the Climate Initiative is, and what I think makes it unique.

Matt Barwick:

A description of the core elements of the Climate Initiatives investment plan, and how those elements fit together. A summary of some of the costs associated with this program in its first phase. And a bit of a summary on next steps from here and the importance of collaboration.

Matt Barwick:

First of all, the Climate Initiative, in terms of what it hopes to achieve, it doesn't seek to try and as they say, "Boil the ocean." We aren't trying to solve the global climate challenge through a single initiative. But the vision of the initiative is very much around ensuring that our industries and communities are able to prosper regardless of the pressures of a changing climate.

Matt Barwick:

So, recognising that we need to get to a point where our agri system, is able to thrive regardless of the change that may be coming at us. So that's the vision that the initiative has been working towards. And so not surprisingly, the objectives then of the program are around focusing innovation and investment on enhancing resilience and performance of agriculture, fisheries, and forestry in the face of climate change.

Matt Barwick:

Enhancing an innovation system and capabilities to address complex challenges, and developing attractive investment opportunities with clear value propositions. Now, each of these three objectives, as important as each other, it's not just important that we have great ideas. We have to connect them to ways to invest and bring those to reality.

Matt Barwick:

It's an opportunity for us to look at how we might move forward in terms of a wicked problem, which is obviously climate change. But also see that as an opportunity that it is, which is to learn how we can work together to tackle wicked problems in general. Because there are many, and they're always hard. And we frankly need to find ways that we can deliver more impact in that area.

Matt Barwick:

And so essentially, our working group within the Council of Research and Development Corporations of several of the RDCs, including the FRDC that I represent, the Fisheries Research and Development Corporation, have been working together to try and take this forward. Essentially we all know and understand that climate is coming fast at all of us, in fact, some of the impacts are already being felt. And it's a great opportunity for us to all work together. And over the last 12 months, that's what's been happening.

Matt Barwick:

But we've also been working with innovation facilitators like Meld Studios, Asymmetric, and Climate-KIC, that gave us some fantastic tools and methods that we can use and are obviously very native to the environment of developing solutions to climate. As I mentioned, I've been supported by a fantastically capable reference group of grassroots fishers, farmers, and foresters across Australia, that have been helping us to develop a really good understanding of the problems to be solved.

Matt Barwick:

This entire process has been embedded in a method called human-centred design thinking, which essentially is an approach that's used in the design context often. It's really around using a range of cognitive strategic and practical processes, to help to develop design concepts. And so, a key output of this process was developing an investment plan, to then go and seek investment to take the solutions forward. And so clearly it was applicable in that context.

Matt Barwick:

Design thinking is really underpinned by a diagram, you can see there, which is... They call it the double diamond, for obvious reasons. You spend a lot of time in the first part of a process to make sure that you are solving the right problem. So you understand the most important problems to solve. And you do that, through a process of creative, divergent thinking, to look at all the problems that might be solvable, and then selecting down to those that have the highest value.

Matt Barwick:

And then you move into a second phase, which is about looking at all the ways you could solve those problems to determine the right ways to solve those problems. Again, through a creative, divergent process. And then you select down to those options that have the most value. That large team that I took you through a moment ago, broke into four teams around four specific investibles, that I'll be taking you through in a moment. That were identified as very high value, and the first things that we need to tackle.

Matt Barwick:

And those four teams were coached by the innovation facilitators that I mentioned. So using human-centred design thinking methods, for some, for the first time, to try and develop up four investibles that became the basis of the investment plan. That you can see in the centre top of the screen there.

Matt Barwick:

And essentially it was all about identifying an investment programme that was attracted to investors, that can operate with scale, and that can deliver meaningful benefits for producers and work towards Australia's national interest. The process, we needed boundaries, we needed criteria.

Matt Barwick:

There are lots of things that you can do, but how do we select the things that we should do? And so there were four lenses, if you like, that we looked through in terms of the solution space; this possible solutions. Clearly, they needed to be desirable. By desirable, I mean both by end-users, so the producers themselves, as well as by investors.

Matt Barwick:

So in order to identify great solutions that are investible, clearly those two parties needed to see the value in them. We also needed to identify technically feasible solutions. It was critical that we could actually do the things that we needed to do, and they also needed to be financially viable.

Matt Barwick:

And the fourth dimension was of course, that they needed to be ethical. So in response to climate, there are a lot of things you can do, but what other things that we should do. They were the four dimensions; the four criteria that we explored as we looked through all of the opportunities to build into the investment plan. As an initiative, I think it's important to raise some other elements that I think make it unique.

Matt Barwick:

It was not about developing a series or a constellation of disconnected projects. It was definitely about trying to develop a portfolio of connected projects within a program. In looking at the possible solutions that needed to be built into the investment plan, we needed to try and apply balance across a range of change levers.

Matt Barwick:

So we needed to look to catalyse the identification of shared need, we needed to focus on the infrastructure and tools that might be required, we needed to explore policy settings that might be necessary, capability building and knowledge sharing. I guess this is an acknowledgement that, knowledge sharing by itself is useful, but insufficient. We have to have balance across a range of change levers.

Matt Barwick:

And last, despite the fact that this is around climate, we really, obviously aren't trying to manage climate. We're trying to manage people and provide solutions for changing behaviour.

Matt Barwick:

So this is around socio-economic outcomes that relate to climate. And so I'll take you through briefly in the time I've got left to the four investible. So the process itself revealed 22 areas of focus that clearly require focus. But there were four, as I mentioned, that due to their high value nature, and the fact that they are foundations for everything that should follow, that they surfaced as the things that we needed to do first. And I'll summarise them now.

Matt Barwick:

The first is called risk and resilience. So it essentially involves an analysis of sector level risks and vulnerabilities with the generation of novel options for response. I suppose the insight that was central to this is, that we understand dimensions of risk around climate. But largely that occurs at large scale and long-term time horizons.

Matt Barwick:

Once you start to scale down to local or regional scale, and short to medium term time horizon, five to 15 years, the data is insufficient to enable businesses to say, to understand what it means for them in their lifetime for their business. And so risk and resilience, seeks to provide that information at those scales.

Matt Barwick:

The second investible is called grassroots and green shoots. It's all about place-based community connected solutions. Because production industries can't tackle climate issues in isolation. It's really an acknowledgement that, collectively people can achieve more than we can individually.

Matt Barwick:

And there are already some place-based community solutions that are emerging. Whether you talk about tree-planting collectives, or micro grids, there are some examples of success that already exists.

Matt Barwick:

And we need to identify them and amplify the ingredients of success of how they've come to be, and essentially create more. The initial investment will be targeted around extension and facilitation support for producer groups in order to accelerate action at a regional scale.

Matt Barwick:

The third investible area is called sense and sensibilities. It's around producer-centred action that aligns to production systems and producer aspirations. Sense and sensibilities is all about acknowledgement that there are already a plethora of tools and systems that exist to help people to understand challenges, risks and opportunities, in the climate space. But either for many of them, people don't know they exist, or they don't know how to use them into operably.

Matt Barwick:

In order to overcome that problem, we need to build the capacity of an advisor community, who can sit down with producers, and understand their business environment, and recommend for them specific tools and compliments of tools, and teach them how to use them. And as they start to get feedback from those producers about the things that are working well or less well, we can iteratively adapt and improve those tools and systems, to improve their interoperability and their value overall.

Matt Barwick:

And the fourth and final investible in the first phase of the Climate Initiative is called baselines and beyond. It's around the maintenance of robust, credible emissions baselines, and tracking to assess future performance and demonstrate that performance to markets.

Matt Barwick:

So there's an acknowledgement that markets progressively will become more sensitive to carbon performance of industries and commodities. We, at this time, don't have robust, repeatable, defensible and communicable baselines for greenhouse gas performance.

Matt Barwick:

Certainly not at a regional or commodity scale. We need to develop those, and as our industries respond to what we're learning, we will have a great story to tell in a marketplace that expects high performance in that area. So just to summarise how these four things fit together, these are four questions that a business or businesses within a region might seek to answer. First of all, they might want to answer the question, well, what are the risks to me and my business?

Matt Barwick:

And that's where Risk and Resilience really comes in. They might then ask, well, what are the solutions that might work in my context? Grass Roots and Green Shoots is really about giving them the answers to that question. They might ask, well, how can I make sense of all those solutions that exist?

Matt Barwick:

That's where Sense and Sensibilities comes in. And then in terms of how we track performance and demonstrate that performance to markets, that's where Baselines and Beyond plays a role. And clearly, all of these four investibles are highly interconnected. So in terms of the estimated costs, the investment plan that's been developed projects a cost for the first phase, the first three years of around $11.5 million spread across those four investibles.

Matt Barwick:

But I need to make clear that there's probably some value and some more detailed costings being developed. This will be an iterative process as we take these concepts through to full execution. And so in terms of execution, how is that looking? Well, look, it's early days, but the signs are good. So the investment plan was developed and was submitted to the council of research and development corporation, and it's been endorsed by the council.

Matt Barwick:

The 11 Research and Development Corporations that have participated in the development of the investment plan, the first phase, have committed an intent to participate, and there has been significant commitment of financial contributions to the next phase from research and development corporations, which is great. Under the '21, '22 federal budget, the Australian government has delivered $1.3 million in seed funding to Agricultural Innovation Australia, a company that the research and development corporations have invested in to try and tackle cross-industry problems, climate being a key one.

Matt Barwick:

And so that seed funding is great to support AIA, to develop investment strategies in key areas, including climate. And Agricultural Innovation Australia, or AIA is working through their approach to the climate initiative. It's still quite early days as a business, as an organisation it's still quite young, but they've already committed funding for critical methodological research through the Climate Research Strategy for Primary Industries or CRSPI, which is a precursor to Baselines and Beyond.

Matt Barwick:

So we know we need to develop those robust defensible accounts, but what methods do we use? Well, that really great work will help in answering that question. So in terms of looking to the future, this is an initiative I personally feel has been really special, and I'm not sure whether it's because of the method that's been used, the human centred design approach or whether it was the people that are involved or the significance of the issue that we simply must try and resolve or all three.

Matt Barwick:

But nonetheless, I've never seen a collective of people working in the way that that has occurred. And I think that's been fantastic to this point and it must continue into the future. That element of collaboration is so central and critical. And I mentioned the reference group, all the Grass Roots producers around Australia that had given their time and that's been fantastic.

Matt Barwick:

And we'll be circling back to those participants in the very short term future to explore their appetite to continue in the next phase. And I need to make the point also that in the climate space, it's an increasingly crowded space. There is some fantastic initiatives, the Future Drought Fund, obviously the Australian government's agricultural innovation agenda, CRSPI that I mentioned earlier, and a plethora of others.

Matt Barwick:

And we need to continue to understand who those players are and what role they play in the system and how we work together to prevent duplication and make sure that we're all working together to optimise our shared impact. So where to from here? I mentioned there's 22 focus areas that have been identified and the investment plan really just covers the first four.

Matt Barwick:

That diagram you can see to the right there, we affectionately call the wedding cake, and it's all the different investibles or the focus areas. There's a need to develop those remaining focus areas up in two investibles as we seek to implement the first four that are built into the investment plan. Those four investibles need to be successfully delivered, demonstrating collaboration and co-investment in the process.

Matt Barwick:

There's need for continued discussion about where the climate initiative eventually lives and the governance and innovation arrangements around that. And so we're really just at the start, but I think what I would say at a high level is the method that's being used has been really effective in helping us to identify solutions that potentially have great value.

Matt Barwick:

And there's a lot of work yet to be done from here, and we look forward to working with a lot of actors as we try and work together to achieve the vision that I mentioned earlier. I might just leave it there, but thanks very much for the opportunity to give you a bit of an update. I'm looking forward to any questions.

Anwen Lovett:

Great. Thank you, Matt. And I do have a couple of questions for you. So the first question is from Blake Zur, who is asking, how do you see each of the R&D corporations working with the hubs going forward?

Matt Barwick:

It's a really important question. There's been an initial meeting of the hubs and relevant research and development corporations to answer that exact question. I think the answer is it might be premature to put too much meat on the bones, but the intent is there. That's really what's important. We need to understand each other's environment and what we're trying to achieve, and that conversation has started and shouldn't stop. And the opportunities for collaboration will emerge through that process.

Anwen Lovett:

Thank you, Matt. And I think it's fair to add the term RDCs are looking for opportunities to work with hubs individually, but also collectively, which is one of the reasons why we shared the climate initiative with you today. Another question for you, Matt, from Bella Andrews, who asks, what do you see as the key differences and similarities between climate resilience and drought resilience?

Matt Barwick:

Yeah, it's a great question. I think that they're inextricably linked. I think that drought is one of the symptoms of climate and there are many others like increasing severity of weather events, of course, and some areas being less hospitable into the future changing in terms of risk profiles around biosecurity.

Matt Barwick:

So I would say clearly, our response to drought and response to climate needs to be compatible. We need to consider this in a systemic way, acknowledging that drought is only one of the unfortunate effects that we will see from climate. I should make clear also, there'll be opportunities as well, and we must be looking for those.

Anwen Lovett:

Thanks, Matt. And another question from Stella Martin, who asks, you said that you're expecting markers to become more sensitive to carbon emissions and baselines. Where are you already seeing this sensitivity?

Matt Barwick:

Look, that's a good question. So I mean, I'm from the fish space in obviously fishing and aquaculture, and I probably couldn't speak on behalf of all of the relevant industries, but I'm sure that they would have their own stories to tell. Certainly in the fish and aquaculture space, there is some examples of Southeastern Australia being one of the worst impacted areas in terms of changing current strength and temperatures and the impacts that that presents for climate.

Matt Barwick:

And there's some really other great examples such as the Bering sea, where entire stocks of species have moved 1,000 kilometres into another region. And so I think what I'm saying is markets will differ in terms of their sensitivity, based on their vulnerability and their exposure to relevant media and the like.

Matt Barwick:

So I probably couldn't give you a comprehensive picture across all of the Agra System except to say that it will be contextual and it will be... As we move forward, I think it will be more of a feature in terms of markets that we need to be responsive to.

Anwen Lovett:

Thank you, Matt. And we are seeing industries like the beef industry being really proactive around this, for example, they're seeing 30 initiative and certainly the project that's been developed through CRSPI is around developing a common accounting framework so that ultimately if the agriculture sector wants to engage in net zero targets, it actually has an understanding from a sector point of view, where we are actually positioned now and where the opportunities might be.

Anwen Lovett:

Matt, I have a cheeky question for you. I can't believe this has been given to me, but Tony Kennedy wants to know, the door behind you looks Japanese in style.

Matt Barwick:

Yeah. Yeah. I suppose it does now that you mentioned it. Yeah. No, I'm-

Anwen Lovett:

You look like you're in FRDC.

Matt Barwick:

I am. I'm just down the road in Deakin and in the FRDC offices. I think that the designer must have gone with a bit of a Japanese motif, I agree. That was some years ago now.

Anwen Lovett:

Okay. Thanks so much for your time today Matt, I'm going to let you go, and I'm going to move us on to our last presentation, which is a short one from Michelle Ford, who is the acting CEO of Agricultural Innovations Australia. As you've already heard from Matt, it's early in the life of AIA, but things are starting to happen with AIA and we were keen to let you know where things were at. So thank you, Michelle.

Michelle Ford:

Thanks, Anwen. So Ag Innovation Australia, you will have heard about Ag Innovation Australia, the name has been banded about, but possibly you might be unsure what it actually means and what we're up to. So I'm hoping that today I can share a bit of information and that will take away two things. Those are that Ag Innovation Australia is a not-for-profit company that's established to facilitate joint investment. So joint investment and collaboration, those are the two things, in cross sectoral agricultural industries of national importance.

Michelle Ford:

So the intent is to identify, develop and invest in strategies that address those shared challenges and deliver the transformative outcomes that we need. So transformative, by that we mean joined up, where more than one RDC might be working in a space where there might be more than one player in a space, but actually doing more than just the incremental things that Matt was talking about earlier, and having those initiatives that will change the... Move the needle in sustainability, productivity and profitability. So the scope for AIA is Ag, fisheries, forestry value chains, it's input, it's supply, production processing and export.

Michelle Ford:

It's the whole lot. The focus again, is the areas with the greatest impact. So across multiple industries where the industry investment from RDCs or industries, but on their own, will be unlikely to be effective, will be ineffective. The members of AIA are the 15 RDCs, and funding is made up at the moment of member subscription fee, so that's the 15 RDCs, and we're looking for investment from anywhere, from public, private, not-for-profit global commercial entities. So that's the intent.

Michelle Ford:

So why we were created, everybody knows about the inwa report from March, 2019, and then the modernising of the RDCs report. Out of that popped five pillars of reform and of those five pillars, the RDC joint investment entity, AIA is one of them. So it's about AIA providing strategic leadership. It's about AIA providing opportunities for investment and funding that may not exist at the moment for a variety of reasons, for investors not knowing who to talk to or not being able to talk to RDCs as a collective.

Michelle Ford:

And it's about world-class innovation. So the other aspects... And I'm sorry, one thing I wanted to say when I look at this, I see AIA under the first three pillars. That's not to say that we, AIA, won't be working under their strengthening your regions work, which is where the Future Drought Fund fits, so I think, and we'll be working in data and the innovative platforms need it to deliver all this innovation. But it's the three ticks are the real key areas where AIA will be performing, will be delivering.

Michelle Ford:

So AIA was set up in March, and so they were set up in September, 2021 and we've been setting up, we've been establishing. It's been quite, took quite a long time, and the first step was to recruit board. So I've put this slide up because I think it's really important. We all have these slides with all our organisations and we know who our board are, but I want to explain what our board are bringing in order to explain what our company will deliver.

Michelle Ford:

So I'm going to start off with our chairman, Bernie Brookes, he had 28 years with Woolworths, nine years leading Myer. He's established retail businesses in India, sourcing offices in China. He spent three year running South Africa's largest non-food retailer. He's got experience in retail and wholesale operations in IT, supply chain, change management, multi divisional organisations. He's also got experience in fundraising because he took Myer through an IPO and he's got a variety of other business interests as well.

Michelle Ford:

So he really is an entrepreneur, he's commercially focused and his background is in Ag, so he's learning. So then I'll take you through the others. Anne O'Donnell, she's got 40 years of experience in the finance sector. She's currently the representative for the Australian Banking Association on the banking code compliance committee. Her former roles are the MD of Australian Ethical Investment limited. She was the chair of Beyond bank. She is a director of Grain Growers. Get on to Kathy. She brings both financial and agricultural focus. She was the deputy chancellor of Deakin university and her roles have spanned wine, wool, pork, red meat, dairy.

Michelle Ford:

She's a former director of Australian Pork limited and of Grape and Wine RDC, and she was the finance director for the Woolmark company. So we've got Anne Astin. She currently chairs the Food Agility CRC. She's the chair of the William Angliss Institute, so educational institute. Dairy Food Safety of Victoria, and the Good Shepherd Australia and New Zealand. She's been a CEO, she knows what businesses need to do and need to deliver.

Michelle Ford:

She's held senior positions in the Victorian government. She's recognised for her work in the dairy industry, in food regulation and support for women. And the AM after the name is the order of Australia Medal, and the PSM is the Public Service Medal. So really well-recognised and has done a lot. Heather Stacey, last but not least, brings agribusiness, heavy industry, fast-moving consumer goods, health, and government experience. With leadership in procurement, manufacturing and distribution and business systems, and she's had roles with Fronterra, BlueScope Steel, Simplot, Metro Meat, directorships of the Rural Financial Counselling Service, AgriFutures and WorkCover Victoria.

Michelle Ford:

So there's no question it took a while to recruit the board. The first board meeting of this board was in March this year. So this board has only really been going and been in the driver's seat since March. And the next phase, the next thing will be the delivery of a CEO. And I'll let you know, we'll let you know more when we have something to announce, when we can. So what will AIA actually do? So we know why it was formed, we know who is leading it, but what will it actually do? It will consult with a broad range of stakeholders.

Michelle Ford:

That's really key to our business, the business. And the climate initiative as again, Matt said, was a really good example of best practice in how real problems can be identified and validated, and then those things taken through to meaningful investment initiatives. And as Matt said, that's what we're working with them to deliver.

Michelle Ford:

So we'll also be working with others, and some projects will have public good outcomes and some will deliver tangible, actual more tangible value back to investors. There's almost two arms to the work that AIA will be delivering. We'll be working with investors, so critical to the success will be our ability to attract investors into funding the project, the actual things that are the outcomes, and to adapt our funding structures for implementation to suit the needs of those investors.

Michelle Ford:

So last thing I wanted to mention about how AIA will do things is the way that we separate funding. So funding of strategy, identification and development is provided by the RDCs at the moment, by member subscription. So the members at the moment are the 15 RDCs. In future, it might be open to more entities, but at the moment, RDCs are our owners.

Michelle Ford:

The implementation though will be for each individual strategy or initiative. People can pick and choose what they will or won't invest in. So it leaves a lot of flexibility for projects to be either the public good projects or also to be projects that are more attractive to investors. And I guess the other point of difference is, AIA is a company set up separate to RDCs and doesn't have the obligations of the statutory funding agreements. So it actually has more freedom to operate and do what needs to be done than RDCs do, who are very driven by solely focusing on their levy payers and delivery back for the levy payers, less so for the overarching public good.

Michelle Ford:

So I apologise if this slide seems a bit shouty and I know there's lots of bold and there's lots of capital letters here, but I really wanted to explain from my perspective, what AIA is and is not. So it's not a 16th RDC for all the reasons I've just talked about, it's been set up to be different, and it's been set up to do things that RDC structurally can't do. AIA doesn't have funding of its own. It's not an RDC that gets a set amount of R&D levies to invest in R&D.

Michelle Ford:

It will need to attract the investors by demonstrating a benefit return on investment. It's also, and these are my words, it's not a dumping ground for every idea that doesn't have a home and doesn't fit anywhere else. As you can imagine, there's been quite a few months since AIA was announced, and there's been a lot of inquiries and a lot of suggestions about a lot of people tapping on the AIA shoulder asking for money, asking for grants, which we don't have, that's not the function of AIA.

Michelle Ford:

What AIA is, is it's been established. It's a company that will facilitate joint investment, will facilitate collaboration where there's cross industry issues and they're of national importance. So from an RDC sense, it's about multiple RDCs, not individual or RDCs working together, which they do very well and often don't get enough recognition for, but this is about those larger complex cross-sectoral issues. So AIA is also, it will be an agile, or have an agile investment framework. We need that in order to attract the resources and the large scale investments that will fund the strategies.

Michelle Ford:

And that will be different to what is already in the RDC system, the agricultural system at the moment. So the benefits. The benefits of AIA to RDCs and levy payers will be increased collaboration, a more effective leveraging of all that knowledge and tools and resources that exist within RDCs, all the good people, all the good work, but actually making sure that there isn't duplication and making sure that things are delivered to a commercialisable or deliverable outcome.

Michelle Ford:

And as I mentioned, members will be able to choose which individual strategies, initiatives time to project level they will invest in so that they can get the optimum return on investment for those resources. The investor benefits, a single point of contact for cross industry investment. It will be easier for investors to navigate and partner with the Australian agricultural system.

Michelle Ford:

We'll have an agile framework and we will attract resources. And I'm just going to finish up. So why am I here? Why am I talking? I want to reemphasize again, that for the Future Drought Fund, we're a single point of contact for cross industry investment, large scale cross industry investment, multi RDC, multi-sector to make it easier for investment in the things that we all need to do together. So thank you for listening and my contact details are that if you want to reach out with any questions.

Anwen Lovett:

Thank you, Michelle. And look, we are out of time, but one very quick question from the audience, which has come from Kate Morse, who's asking how AIA plans to deliver the strategic leadership role and lead the way forward.

Michelle Ford:

I don't have an answer for you right now. I know that, so one of the things we're doing within AIA is making those decisions where we're actually setting our strategy. That strategy will inform and will tell you how we will plan to deliver that. So without preempting what's going to be in the strategy, all I can say is we're working on it and we'll let you know, we will have something that we'll put in the public arena pretty soon.

Anwen Lovett:

Right. Thank you, Michelle. And that's the end of that Science to Practice session. I'd like to thank everyone for sticking with us, and also thank you to our five presentations. We've covered an awful lot of ground, but I certainly hope that you found that interesting and engaging. Just a reminder, you're more than welcome to also reach out to the CRSPI secretariat.

Anwen Lovett:

We are here to coordinate and share information, so if you want to follow up and make any connections from what you've heard in the session today, please just reach out to me. There's an email address on the CRSPI website. So thanks for your attention, and I think that's it.

Andrew Bell:

Thanks, Anwen Lovett, for guiding us through that last session. Science to Practice, it's in the title of our forum. So thank you so much for doing that and to all your contributors around the country. Yes, it's lunch brunch time around the country, we'll be back in about half an hour to go to our final two hubs. But before we do go to lunch brunch, can I just wish those in the Northern Territory, happy Territory day. Back in half an hour.