# 2023 National Biosecurity Forum

Event transcript

5 April 2023

Canberra, Australia

## Session 2: Integration supported by technology, research and data

Richard Morecroft: So as that panel concludes, we move straight on to Session 2, essentially part 2 of today’s program and that second part is focused on integration supported by technology, research, and data and our next speaker for today is Joanna Bunting, Assistant Secretary, Agricultural Traceability at the Department of Agriculture, Fisheries and Forestry. Joanna is going to talk to us about the work that’s being done in this space, so please welcome Joanna Bunting.

Joanna Bunting: Thank you. And yes, I can drive my own slides, I say that now, but let's watch me somehow stuff that up. Thank you, Richard. Today, I'd like to talk about agricultural traceability and how the sector and the governments at all levels are working in partnership to achieve a future that supports our trade and biosecurity outcomes. We already have world class traceability systems, of course. They are integral to our continued access to valuable export markets and our ability to respond to pest and disease outbreaks and food safety incidents. Traceability, focusing on the movements of animals and products in the supply chain, provides the evidence to maintain trust in Australia's approach as a provider of high quality, safe and sustainable food and fibre products. It dictates how fast we can recover from a pest or disease incursion too. However, we're seeing more demands from consumers and importing countries to provide that evidence to show our products are safe, clean and sustainable from paddock to plate. Our word is no longer as good as it could have been through no fault of our own and our trading partners are scrutinising our export certification systems, which are in many parts underpinned by traceability systems that are shared and run across governments and industry. Consumers also use traceability to understand more about the products they buy, information on providence authenticity and social matters, including sustainability and animal welfare. And at the same time, if that wasn't all enough, advancements in technologies, and particularly in digital transformation enable and make it easier to track the movement of a product or commodity from production through to distribution or what we can call end to end traceability. So improving our traceability is about improving how our supply chains function, adding value for producers and value added business outcomes for employees, employers, exporters, governments and consumers. And as the minister said in relation to biosecurity, about protecting what we have and bringing benefits that touch everyone. It's a shared responsibility, a priority for governments and the department including for biosecurity. Let's see. Yes. As part of this shared approach, the Australian government is contributing to uplift and address some of the headwinds and opportunities I just mentioned. There are 4 key areas that we're looking at. The first is support for an industry-led national traceability strategy to give clear direction and to drive change to make sure we are all pulling in the same direction to make the whole greater than the sum of its parts. The second is to support industry to demonstrate consistent credentials, including on sustainability for climate action and Indigenous agriculture to benefit First Nations peoples. The third is support for industry leadership to work with governments and develop fit for purpose data-enabled traceability and regulatory technology systems. And the fourth is provision of national leadership with state and territory governments and industry on biosecurity, in particular, and I will come to it, livestock traceability reforms. On the 2nd of March, the Minister formally announced the development of a National Agricultural Traceability Strategy, to progress on the first outcome I mentioned. As he put it in the media release, Australia has a great story to tell, but we've been missing a national approach on how we'll deliver future focused agricultural traceability systems. This work builds on development of a national traceability framework in 2019 and other work across with many of you involved on traceability. The strategy and the implementation plan that will come after is being oversighted by a new industry led group, the Australian Agricultural Traceability Governance Group or AATGG for short, great acronym, which was also announced by the Minister on the 2nd of March. The group first met in February this year and provides guidance to the Minister on Priorities and Action for agricultural traceability systems and its industry led, but includes representation from industry, governments at different levels, peak bodies and others in the supply chain.

So what's in the strategy itself? Extensive consultation and co-design on agricultural traceability and export trade from 2021 through to late 2022 identified a real need for a cohesive approach to ensuring all our systems, commercial and government, are fit for purpose into the future and can adapt to emerging requirements or threats. As a result, a 10-year industry led strategy was co-designed. It covers an includes a key vision, objectives, pressing challenges and priority areas for action and the QR code on the screen can be scanned through to a draft that was released for consultation and workshops last year. These concepts are shared, traceability is shared, we all have a part to play, whether a business, farmer, state government or the Australian government. We expect to launch the strategy mid-year and work has already started together with industry and others to develop an early stage implementation plan. And that plan will be important because it will feature and identify the key activities and contributions from all of us, industry, research organisations, governments and others, to address the issues and help us achieve the vision of the longer term strategy. We want it to be achievable, feasible and we want to consider the benefits and how to measure our progress towards achieving them. We expect that draft plan will be finalised and shared late in 2023 and then launched in 2024. And along the way we are already and want to work with many of you, so please do reach out if you haven't heard from us or been able to engage yet. And thank you to those who have contributed so far. As I said before, traceability is a shared responsibility and we are in partnership with many on this. We will be inputting to the implementation plan as well with our activities as the Australian government and as DAFF and so I'll touch on what we are doing already. So far, in addition to providing the mechanism and convening power for the national strategy and the governance group, there have been two recent competitive grant opportunities focusing on supporting credentials and digital innovation. There were $6 million announced for the agriculture traceability insights round to promote uptake of existing and new traceability technologies. There was also a $4 million national agriculture traceability sustainability reporting uplift round to support the ag sector to fill gaps against emerging sustainability requirements.

If I hold the microphone, it still works. Ok.

These investments are supporting the government priorities looking at consistent credentials, market access, and dealing with data and also key priority areas for action under the emerging draft strategy. They build on other investments over recent years including improvements to our export certification systems that are always ongoing and further investments may be announced in the coming months, supporting consistent credentials and sustainability requirements, traceability, innovation and more so watch this space. Last but definitely not least, well my system is failing, a key priority for investment is livestock traceability. Minister Watt has said that a contact tracing system for livestock is crucial for our biosecurity preparedness and response and to help us recover faster if exotic pests or diseases get into, or emerge in, Australia. A significant component of the overall investment currently in traceability is $46.7 million announced at the 22/23 federal budget in October to support national livestock traceability enhancements. This is also part of the three-prong approach that the Minister referenced as we do a health check and seek continuous improvements of our systems. The funding is for co-investment with state and territory governments to support on and off farm traceability improvements, including the rollout of individual electronic identification for sheep and goats, and it's also to support the uplift of the National Livestock Identification System database and associated systems, which is a fundamental backbone of both our biosecurity and trade outcomes. The investment also supports a decision in September 2022 by all agriculture ministers to implement E-ID for sheep and goats in each jurisdiction working towards the 1st of January 2025 for implementation. This is a national reform and to help support delivery of the important reform, the National Biosecurity Committee established a new industry government sheep and goat traceability task force. Its role is to oversee national implementation and provide ongoing advice on national implementation efforts to senior officials and agriculture ministers and the sector more broadly. The Commonwealth is supporting and providing secretariat with this task force and also contributed in the first couple of months by supporting an industry governments co-design initiative to help inform the task force and its ongoing consideration on reforms. Further information on and updates on the implementation of this reform are available on the website for the task force which is hosted on the DAFF website under the National Biosecurity Committee. We're only of the start of that implementation journey even though much has been done to get us to this point and we're looking to continue to work with all governments and industry on the practical implementation of these reforms. A number of jurisdictions are still working through implementation arrangements in consultation with industry and I urge people to maintain, engage, to help us get harmonised outcomes for the benefit of Australia overall. To conclude, I want to restate that traceability is a shared interest and responsibility for all of us, and that is why we need to continue to approach this as a partnership. The Australian government has got some skin in the game, as do others, and this is a point in time where we are kicking in a bit more investment than usual because there's an opportunity to support change for outcomes for Australian producers and exporters. The investment is significant, but it won't achieve the full vision of a future focused national agricultural traceability strategy on its own. It's not an ongoing funding contribution. We all need to work together on implementing the strategy and ensuring continuous improvement of our systems in the future. Industry leadership is central to the success, working with governments and it's on all of us to invest in good outcomes. Thank you very much for the time and for the opportunity, and I will be sticking around for lunch, so I'm very happy to chat about any of the content offline because I know we are very pressed for time with the agenda today. Thank you.

Richard Morecroft: Thank you very much indeed, Joanna for that excellent presentation, including insights amongst other things into the National Agricultural Traceability Strategy and of course the importance of livestock traceability. So maintaining the focus but with an emphasis next on the digital realm, we're now going to hear from Sarah Corcoran, CEO of Plant Health Australia, examining integrated digital biosecurity systems, so would you please welcome her, Sarah Corcoran

Sarah Corcoran: Thank you very much, Richard. Now if I hold the microphone, I might sing and we don't want that. And I can see the mood lighting has improved a little. So there's people online.

I'll keep talking into. Right. Good.

Hello and welcome, everyone. I am Sarah Corcoran, the CEO of Plant Health Australia (PHA). And today I will introduce you to PHA's integrated digital biosecurity systems and the power of biosecurity data. So technology is an enabler of biosecurity as evidenced in the Commonwealth Biosecurity 2030 document that outlines in order to realise the goal of a risk-based biosecurity system that protects our way of life, the government will, among others, focus on technology to ensure the system is integrated, secure, data driven and technologically enabled. Likewise, in CSIRO’s Australia's biosecurity future report, high and fast data sharing, up-to-date and adaptive infrastructure, and strategic technological developments form part of the transformational 2030 trajectory. Developing procedures and systems for timely biosecurity information exchange, as well as driving the development and investment of innovative technologies for greater efficiency, will improve detection and surveillance and is key to the delivery of a nationally coordinated and resilient system. As the trusted coordinator of plant biosecurity systems, Plant Health Australia plays an important role in realising these biosecurity visions. So what do we mean by data? The word data is often used interchangeably or as a catchall for when we really mean intelligence or trends and information sharing. At PHA we add value to data, so those raw numbers, by collating information and through analysis we transform the information into insight and intelligence that informs decision making. PHA recognises the value of integration of biosecurity programs and systems and are focusing on improving this via our third strategic priority enhanced integration in our 5-year strategic plan. Our digital systems speak directly to this priority and can only be achieved in conjunction with the portfolio of work under our other two strategic priorities, strengthen partnerships and responding effectively to plant pest incursions. Being able to leverage data and technology for improved decision making and rapid response to biosecurity threats underpins these activities and how do we do this? We gather intelligence and feed it back to our member base. For example, our facilitated national annual debrief of incidents where we examine responses in the context of approach rate to the border allows for examination of trends of the biosecurity risk that we face and could be further enhanced with interception data to assist policy setting and improving prevention and preparedness.

So PHA administers a number of digital systems integral to national plant biosecurity. These include the Pest and Disease Image Library, or PaDIL, the Australian Plant Pest Database, or APPD and AUSPestCheck. It's these national systems that collect and collate surveillance and diagnostic data to support early detection and market access, and they are recognised assets and infrastructure of strategic national importance to biosecurity. The APPD and PaDIL support accurate diagnosis of plant pests and diseases for regulatory and management purposes, and the determination of their pest status. They're also really important resources in any diagnosticians’ toolkit. AUSPestCheck is the repository for national surveillance data and captures critical data from the National Plant Health Surveillance Program and industry partners. This system enables the collection and collation and sharing of surveillance data and offers the solution to responding to those future risks by building connectivity. All 3 systems facilitate sharing of biosecurity information and the data necessary for efficient functioning of our system, and they hold that data to inform the decision making.

And we all know that in the absence of intelligence, information is patchy and confusion reigns, so let's talk more about how PHA overcoming this. AUSPestCheck is our flagship digital system for surveillance data. The cloud-based system is designed and developed and maintained by PHA and brings data together from multiple organisations and stakeholders with the purpose of collating and sharing that information, as well as visualising it and mapping the data, to demonstrate the coverage and extent of monitoring for different pests and diseases. Endorsed by the National Biosecurity Committee, AUSPestCheck is the national system for collation of plant pest surveillance data. It brings together data from different participants, such as jurisdictional government departments and industry bodies, into programs where there are shared surveillance targets and there are currently over 3.9 million records across multiple government and industry programs. All data are held in a secure environment with flexible access permissions that allow information to be readily collated from a number of sources, including jurisdictions’ case management platforms, their laboratory information systems, and industry trapping applications, all with the ability to be connected by API (application programming interface) if you're not sure if that acronym to create an integrated surveillance data ecosystem. The example that you see on the slide there is using publicly available citizen science data and demonstrates how a national picture of surveillance coverage can be built by multiple observations through both targeted and general surveillance. Increasing adoption and incorporation of AUSPestCheck into plant biosecurity surveillance projects makes the value of the system even more apparent. Through two way sharing of information between industry and government, PHA can provide intelligence that identifies the gaps and the opportunities in their respective surveillance activities and continue to foster meaningful partnerships.

By building up a national picture of the surveillance undertaken for a given plant pest or disease, we can identify gaps in coverage and provide data that informs important management decisions. And by building a solid centralised data set for plant pests, we're providing information critical to supporting trade, market access and proof of freedom and importantly, the ability to return to trade following an incursion. Integrating digital systems with analytics informs decision making. For example, by incorporating Microsoft PowerBI with AUSPestCheck, users are able to generate insight and reports from the data. Building comprehensive spatiotemporal pictures from within or across surveillance programs provides insight into the efforts undertaken to search for an exotic pest or to delimit the distribution or spread of an outbreak. AUSPestCheck has the potential to integrate with other digital systems as well, and we're currently working with partners to investigate how it can hold surveillance data, something it does very well, with systems that are established to hold data and information from other parts of the biosecurity and response sphere. We're also changing the way we build systems so that new functions and enhance can be developed and maintained for a set of stakeholders without disruption to other systems. In addition to our operational plant tenancy in AUSPestCheck, we're currently developing a range of new components to enhance the system to meet requirements of terrestrial and aquatic animal health surveillance programs. Features of the animal tenancy of AUSPestCheck will include scheduling and invoicing of surveillance activities that will be managed in terms of efforts and budgets in relation to activities reported in AUSPestCheck, a web form allowing users multiple data entry options, and export mapping for externally facing maps that preserve data privacy.

Now back into our suite of systems, the Australian Plant Pest Database is an important national digital system that aggregates information from digitised records vouchered specimens of plant pests and pathogens with the 16 major plant pest reference collections throughout Australia. The APPD supports Australia's plant pest status in market access and informs decision making processes during plant pest incursions and also for import risk assessments. APPD significantly improves the diagnostician’s ability to access information in a timely manner enhancing Australia's overall diagnostic capability. The APPD has over 300 registered users across 17 organisations, including state and territory governments, universities and researchers and provides access to 1.5 million plant pest voucher specimens. The APPD allows for comprehensive searching, mapping and linking. Linking back to vouchered specimens and collections is key for users to assess the status of different plant pests and diseases. PHA works with reference collection managers to send data straight to APPD through APIs. As more connections are made, APPD becomes increasingly integrated with collection, supplying data, facilitating the addition of new records and the ability to update records according to the efforts of the curators and collection managers.

The third system I'd like to talk about is PaDIL a repository of high-quality diagnostic images and tools for taxonomic identification of pests and diseases. PaDIL is used extensively by a range of stakeholders, including diagnosticians, performing taxonomic IDs, as well as crop scouts, agronomists, industry biosecurity officers, environmental groups, and departmental border staff. PaDIL is best used as a triaging tool, rather than a standalone resource, and it assists with the rapid identification, which is then verified by taxonomic experts. As part of the rebuild and launch of the new site, which undertook in 2022, we consulted users to ensure that the tool was fit for purpose and provided value and as a result there was some improvement that include a comprehensive search function which allows for Google-like searching of the libraries; we're using selectable facets to search by taxonomy, commodity or distribution; a species comparison tool, which allows for side-by-side comparisons for a number of user selected species to assist in their ID; and feedback forms linked to every species to ensure updates can be easily made and sent the right experts to update and verify. We currently have over 7300 species on the site and continue to work to increase that number, especially for exotic species on our different priority pest lists or which there are many such as the national priority plant pests.

In summary, biosecurity surveillance and diagnostics activities are routinely conducted across priority plant pests and diseases in Australia. This creates data that's related to the same species but typically has been held in separate systems and databases. The 3 systems described today all have separate histories and were originally developed independently from one another. However, they're all aligned in their purpose, and we see an opportunity to bring their functions and features together. Integrated digital biosecurity systems will protect Australian agriculture by increasing our preparedness, intelligence and enhancing connectivity between diagnostics and surveillance systems and allow for timely and accurate information exchange. PHA are working towards having integrated digital systems under a common development and enhancement environment similar to the work we're doing for the animal health project in AUSPestCheck by looking at ways to share data and resources between systems and provide users with a coherent biosecurity toolbox. What this means in practice is having features like PaDIL diagnostic images and species information alongside those APPD searches that I described or PaDIL diagnostics alongside AUSPestCheck maps.

Therefore, the journey doesn't stop at our existing systems. New systems are already being scoped and designed to form other pieces of the puzzle, and for example, that would include something like a high throughput sequencing (HTS) database. That work is generating significant data at the moment, and it needs a repository, and we're leading the scoping required for national coordination of HTS data for a connected diagnostic system. The value of linking such a system to diagnostics databases such as the APPD and PaDIL are clear, and we will continue to seek the opportunity to collaborate and co-fund.

In conclusion, digital systems presented today have all existed independently of each other, as I mentioned, for many, many years, capturing data on the same types of pests but not integrated to maximise their application in managing emerging risks. This is the case for much of Australia's biosecurity data and systems and PHA are resolving this issue through partnerships. By having a number of important tools administered in one place, we are uniquely positioned to develop systems that reflect needs of an ever-changing biosecurity landscape and can facilitate that data sharing for the evidence-based decision making that we need. Be it digital systems, partnerships or emergency response operations, PHA plays a key role in the Australian plant biosecurity system and we look forward to accelerating the transformation needed to ensure the system is solutions focused and future orientated. And please [applause], make sure you help us maintain that national plant biosecurity system and keep up to date with the latest news by checking our socials and subscribing to tendrils. Thank you.

Richard Morecroft: Thank you very much indeed, Sarah. And I think we have a sense again amongst many other things that they're referred to but of the importance of national digital systems and of course the work of PHA in bringing together a range of stakeholders into, as Sarah referred to, an integrated data ecosystem.

Now I'm delighted to say that Jessica May, the Director of Research and Innovation at the Department of Agriculture, Fisheries and Forestry, is going to be facilitating the next panel, and that panel is on technology and industry co design. So I'd like to invite Jessica to the stage along with the following panellists; Nicola Stokes, Senior Environmental Advisor, North Queensland Bulk Ports Corporation; Dr Alejandro Trujillo-Gonzalez, the Senior Research Fellow at the University of Canberra's National eDNA Reference Centre; Ley Osborne, Chief Data and Automation Officer BOD Data Centre, Department of Agriculture, Fisheries and Forestry; and Dr Robert Clements, Change and Communications Manager, Biosecurity Commons Griffith University. Would you please welcome our panel and may I hand over to Jessica May.

Jessica May: Good afternoon, everyone. Thanks for having me and thank you, Richard for the introduction. So this panel will discuss the current co-design initiatives aimed at strengthening Australia's biosecurity system and how technology, automation and data are guiding us to make informed decisions. So our panellists today provide a good mix of experts working in this space, as introduced, so in line with earlier panels, this will be an opportunity for you to ask questions. I'll kick it off by asking each of our panel members a question first, then we'll take some from the crowd and we've also got our online people that I'll take some questions from. So first of all, I am going to ask Nicola, so obviously you work in our ports, Nicola. So why is marine biosecurity important to imports?

Nicola Stokes: So many of you have heard a lot of information come through today.

Is this working? Yes. Wonderful.

Especially from some of our Members today such as Brant Smith, who spoke about the port trade interface, and I guess that's the crux of why Marine Base security is so important to us. What you may not know is that there's quite a dominance in governance arrangements with ports in that we are often very much just landholders and we have a strategic port oversight obligation. So we are not always necessarily the owners of that risk. However, we are the bearers of the consequences. So to give you a little bit of an understanding of the context of why I find it extremely important for us to be involved in this space so heavily, we have over $300 billion per year in costs associated with aquatic invasions worldwide and up to anywhere up to 70% of those costs is attributed to the assets related to port infrastructure. So it is obviously extremely important for us to ensure that we continue to facilitate trade for Australia, 98.8% I think it is percent of all trade, being an island nation comes by sea, so it's extremely important for us to consider how we best manage that and in the frame of this forum, understanding our shared responsibility and facilitating that with all of the relevant stakeholders is our core role to ensure that we can effectively address that.

Jessica May: Wonderful. Thank you so just to reminder for those online to submit questions through the online function so that I can pick them up afterwards. So next question, I'll go to you, Alejandro. So you're working in our environmental DNA reference centre. So you have a lot of experience working with the department and on co-design, so can you tell us how can scientists facilitate co-design?

Dr Alejandro Trujilo-Gonzalez: Sure. I think our main role is to ensure that science is well understood. It is to explore what the evidence base can tell us and see if it's adequate for stakeholders or our co-designers to make an informed decision. And if it isn't adequate, then what does it need for that to be the case? It is our role to be unbiased about what the science is showing so that we can provide our stakeholders both a clear view of the benefits that you can get out of that a specific application, but most importantly the limitations that application has and be frank about the whole thing as well. So it's only through providing that clear view of what the evidence is providing to the co-design that we can provide our stakeholders with a clear view of what can be done.

Jessica May: Wonderful. Thank you, Rob I'll go to you next. So you're working with us on the Biosecurity Commons. Do you want to tell us a bit about Biosecurity Commons? I don't know that everyone knows about that project here.

Dr Rob Clemens: So yeah, so I. find myself really pinching myself because I feel very lucky to be working on this project. But first, let me tell you what Biosecurity Commons is, essentially it's an online modelling tool that allows you to bring together data and scientific workflows and the workflows that we've developed so far that are available online include risk mapping, so where is an incursion likely to occur based on propagule pressure and other things? How is that test likely to spread across the landscape? And where do we optimally deploy surveillance? What kinds of impacts are these things gonna have on both economic and ecological assets? So makes it makes a great use case when you bring together high end statistics, high end maths, to demonstrate the impact that it's a really good business case that you can put together, this is what's going to happen in this area in 5 years if we let this pest run loose across the landscape. So it's great for developing a business case and the reason I'm so excited about the tools that are available is because for over a year I've been watching from a distance, the University of Melbourne and the team at CEBRA, the Centre of Excellence for Biosecurity Risk Analysis and I’ve just been in awe of the science that they're doing. It's really remarkable, high end, practical science that can be applied and then the trick has been to translate that science into sort of these point and click dashboard tools where anybody suddenly has access to stuff that I never had access to before. So I find myself chatting to colleagues about all the amazing things that I can now do because I don't need to be a ridiculous coder in order to do that. And clearly the risk with all of this is you need the team of experts to put together that risk map or whatever your model output is, but in an online environment, you can facilitate that kind of collaboration and then at the end of the day, you have a product that includes all the curated data that developed that output. You have all the assumptions that are inherent in that model, you have the actual scientific workflows that you can download in R and you have results, then not only can you share those results with other colleagues and other jurisdictions, you can use those results as a template to do that work later and next year, when you get new data, you can update those results without having to write a whole new report and having somebody else go through that whole process. So we launched in a month. Get in touch if any of that was of interest.

Jessica May: It’s very exciting. So we've got Ley online from the department. So Ley I'll ask you from your perspective. What lessons have you learned from the co-design process?

Ley Osborne: So thank you for that. It takes longer than you think. So we have to acknowledge the environment that we're in, everybody's, everybody's really competing priorities and you need to start early. I'm sorry guys, I'm getting a bit of feedback. Checking that is not for the audience as well.

Jessica May: No, we can hear you perfectly Ley.

Ley Osborne: Okay great. So it's sometimes tempting to discuss at the implementation stage, we can skip ahead a number of steps. It's really important that we don't do that and that we do the right things to make sure that the code design is successful and is true code design. So at the really earliest stages we need to agree on the ground rules. And when we're talking about technical things that can include a lot. So it's what we're trying to achieve, our outcomes, what legislation is involved, data security and governance is really important with technical stuff and un our case biosecurity, risk management can't be compromised, so you need to go through all those processes and then build up. While I say that you can't skip ahead to the implementation phase, you have to have implementation in mind during the whole thing. Otherwise you end up with a nice co-design plan that is just that, it's a plan, but it doesn't go anywhere. So you need to be considered and work through it all the way. It's not a set and forget process. You have to keep engaged along the whole journey, you have to keep your momentum, so we've done that with various ways through workshops, through weekly meetings, regular updates. If you just start with the co-design meeting and then lose the energy around it, you won't get to where you want to go.

Through all that, we find that there's lots of benefits way beyond what you would expect. So those things that we know helps with change management, helps with actual practical solutions that are implementable, but even beyond that, so in an example, one of the co-design processes the department has worked on at the Port of Melbourne around how new vehicles work through this supply chain and at the moment, you may or may not be aware, but there's a lot of challenges with the import of new vehicles into Australia. And through that co-design process, we built a lot of relationships with important members all through the supply chains that have helped us manage some of those challenges and that was outside of the realm of the actual project itself. So my final sort of comment on what I've learned is this, absolutely worth it and even though you have to be up front about the challenges and the effort that it takes to do it properly, we need to make sure that we still do it where we can.

Jessica May: Wonderful. Thank you. So we'll take some questions from the crowd if we have some ready to go. 7 seconds of awkward silence. No. Ok, I can continue it, so Alejandro, I might ask you another question about environmental DNA. So how does your research impact your stakeholders?

Dr Alejandro Trujilo-Gonzalez: My specialty lies on molecular techniques that can enhance detection probability, right and then that could be, could be anything, could be DNA that is taking directly to an animal is DNA that is left behind by an animal in an environment. My role is to test those technologies that are able to capture that DNA and analyse it in a way that is useful for my stakeholder. And through that I've worked across multiple pathways. I've tested techniques that allow for the detection of pests and pathogens in the ornamental trade, for the detection of pest and pest species in shipping containers, myrtle rust, the incursion boundaries within Australia. All of those scenarios have their own little particular differences between them, and as a scientist it is my role to understand what those considerations are, what the stakeholder is looking for, and what is their end goal that I can use and that can be answered through the signs that I deliver and that's how I can help co-design, it is looking at those opportunities where there's space for innovation and development and where we can avoid making mistakes that have been made in the past or where there's something that is just a complete lost cause now.

Jessica May: Yeah, definitely. We certainly appreciate it through the biosecurity innovation program where we kind of link directly with people to deliver solutions for the department. That co-design process for us in designing the solution is so important. So that's fantastic. Have we got any questions from the crowd? Yes, great.

Andrew Robinson (audience): Andrew Robinson, CEO of the CEBRA, the Centre of Excellence for Biosecurity Risk Analysis. My question is to Rob. Rob, I wholeheartedly appreciate and endorse your warm commentary on the qualities of the works that have been done by the CEBRA and it seems to me that you're sketching a vision of the way biosecurity should be in the future and the open question is, are we going to be able to seize that opportunity or will it sink into the mire of obscurity once again and we start again in 10 years and do it all again? So now or a decade from now, Rob, what are the next steps for Biosecurity Commons? What can this community do to lean in and take full advantage of the opportunities that you've sketched out? Thank you.

Dr Rob Clemens: Thanks Andrew. That's a great question. So first of all I want to highlight the reason we were able to translate that research to begin with was because we had a lot of biosecurity professionals involved and identifying the requirements that this software has to meet. So that translation piece was guided by biosecurity professionals to begin with. But the next step is to keep that active translation going and to build a community of people who are using these tools and collaborating across different jurisdictions, and the Commonwealth, and sort of building templates that stand the test of time. So I'm really impressed that we've got software engineers and others who have built this, you know, I call it a Ferrari, it's it really does a lot of cool stuff. It would be a real shame to just turn that off and not take advantage of engaging the community and using these tools so they can make the most out of them. So building that bridge between science and professionals is what this platform does. It's an example of, we could do this with other workflows, we could do this in other domains, right? We can take science and translate it into easy-to-use tools so I hope we can take advantage of that.

Jessica May: Fantastic. Thank you. So I’ll go to the other person in the crowd.

Trevor Ranford (audience): That's correct, yes. Trevor Ranford, horticulture, nuts, and stone fruit. Appreciate all of the work that's being done in technology. The real challenge is how do you take that to a grower level? And that's really where, for me, the need is to have simple equipment, technology that growers can use to identify, and we appreciate it's not 100 per cent, but again in chestnuts we've been talking with advice about the use of the LAMPs technology, but we haven't got to the we've got to get the, the parameters of the organism first, which costs a lot of money to be able to do that, and then get that equipment in the hands of the right people. So in the areas you're working in, are you working on things like simple, well not necessarily simple, but equipment that can be used by growers in a practical sense?

Jessica May: Probably throw to Alejandro on this because he has a self-contained environmental DNA kit which I think is very easy, just going to say if you look at. Like if you look through that door, because these little white little machine on in the corner on top of a bar stool, that's one of those technologies that we're currently testing for end users, like farmers, like biosecurity officers and so on. That machine, it does qPCR, it does LAMP, as you mentioned, it does other isothermal reactions, like for example have you heard about CRISPR like those? And there's a few more things that little machine can do. That's one of the technologies that are available and there's also much bigger Sentinel units, like the case of the iMapPests Sentinel units, which are now being deployed at farm levels and are able to inform farmers on real time. The issue is not exactly the technology, it is the implementation of that technology over a long period of time, because we need the data to know if what we recommend this being a good decision. Like if I tell you, go and use that little machine, we need time to know that decision was the correct one and for that machine to be reliable, we need more data. So the technology is available, it's there, it's the implementation step that we need to start working on rapidly for that to be available.

Jessica May: Great. Wonderful. So we've got an online question, so I might throw to Ley in this instance, but how can we enhance tech capacity in Australia so we are not always accessing overseas suppliers?

Ley Osborne: Yeah, that's a great question and I think the answer is we do need to leverage our overseas suppliers and the loans from there, like we have to acknowledge that it is a, it's a global economy and we're not limited in innovation to Australia. That said, in the department there's lots of things that we do to try and make it leverage Australia. So for example, in some of the projects that I'm working on, we particularly leverage Indigenous companies to try and use those pathways to leverage Australian groups and to further connect through Indigenous pathways, including connecting with universities and traineeships, etcetera, through those pathways, so that the innovation and work that we do goes sort of circular through into those communities and into Australia.

Nicola Stokes: Can I add to that as well? Yeah. So I guess talking back now to the port face, we often, and I've worked a fair bit in the last few years in the international space, sharing what we know from Australian ports and from biosecurity management, marine specific biosecurity management with our overseas counterparts through my work with [inaudible] and IMO Glofouling and the like. And I think we often underestimate the advances that we make domestically and locally. The work that I've been doing in sharing the learnings that we have available, the technology advances that we have available, through DNA work and through collaborating with multiple disciplines to implement those new technologies, is often, far and wide, much better than some of our overseas counterparts. So more and more when I go over to these type of forums in London and Europe, the feedback is that they welcomed the learnings that we have. They welcome not just the new technologies, but how to actually get those new technologies from a research space at a university, down into industry, being able to be used widely for all stakeholders. So yes, I think we shouldn't necessarily sell ourselves short for that as well.

Jessica May: Wonderful. I might keep going with you Nicola and I've got another question here. So what are some of the challenges? So we're talking about industry overseas and industry together. So what are some of the challenges that you've faced co-designing?

Nicola Stokes: So I think by and large the benefits are reasonably well discussed today, we have the ability if I if I look now at say implementing monitoring programs as an example we implement a Queensland wide DNA monitoring program as an early detection effort for marine pests. Now that program in essence really has a lot of benefits to us as a port and a lot of benefits to our wider stakeholders in the ability to have it cover very large geographic areas because we collaborate with a very large number of different port authorities and also state regulators and the like. However, and I think we touched on it before with the question that was posed to yourself, how do you keep that momentum going in the longer term? How do you keep relevancy for all of your stakeholders going so that you can continue to engage and embrace newer technologies, newer advances, but also continue to deliver those on the ground outcomes? And they're absolutely the biggest challenges I guess, my insight into how to address those challenges is really looking at what stakeholders you’re meeting, what objectives you're designing into the program, and how you making those objectives relevant for each of your stakeholders. So in that way, you may have multiple outcomes, multiple targets that you want out of the one program so that you can deliver those expectations to each stakeholder. Also, I think as well, understanding the ability to progress and embrace new technologies, embrace new outcomes that might come up that aren't necessarily directly within your own sphere of knowledge or influence. So in the marine biosecurity space, we're talking, okay, and early detection program might start off wanting to identify what marine pests are in an area and how we might address minimising the risks, but you might then take that and embrace new stakeholders and look at, okay, what's happening in the advancements of coating designs. Is there the capacity to learn from some of those stakeholders to take our work even further and integrate trials for coatings on static infrastructure, for example. Can I engage in more stakeholders? Can I broaden my networks and allow this program to continue to evolve overtime? So yes.

Jessica May: Wonderful. I have had a great comment online. So someone has said I agree completely with Nicola, Australia is probably leading in terms of marine biosecurity and especially in its collaboration between ports, regulators etcetera. WA has the SWASP and Queensland has their program and both are world leading. So obviously definitely on the right thing. Rob you looked like you wanted to add to that. Did you want to add anything to that? You were champing at the bit there.

Rob Clemens: Yeah, I guess I just want to say that the key to the co-design is getting the community engaged and something like an online platform, for example, the potential of that is really realised once different people are starting to use those tools and share that knowledge. And whether it's fed with new information that informs how to optimally survey for a new pest or it's new data that highlights where an incursion is incurred, the more we're able to collaborate and share with one another and an online tool is one way that can happen. But yeah, as we build community and we tie into those little units of expertise around the place, we're going to, it’s a game changing thing, if that starts to happen, if we breakdown these silos.

Nicola Stokes: And I'll just add there as well, we're starting to look at how the best breakdown those silos, how to best engage in the community, engage in both our general surveillance programs, our citizen science programs as well as our active monitoring programs to really build it altogether, compile as much data as we can and as we were talking about just before, taking that data and making it into intelligence that we can use.

Jessica May: Wonderful. Thank you. So I might throw to Ley very quickly. So on that, how does the department co-design? How do we work together with industry in your area?

Ley Osborne: So a good example is the port of Melbourne project which I which I touched on before so we gather important stakeholders and connect and like I said we go through lots of processes of setting those ground rules, setting the forward work plan, but one of the key things that we do and that I've been really pleased with how it's working, is hand over like, really trust industry on the co-design partner, make it a real partnership rather than a department-led particular initiative. So and we saw real benefits out of where Port of Melbourne understood a lot about what was happening with the supply chain that the department didn't necessarily do before and were able to sort of put together the whole ecosystem to make for a really successful project. And so once we got to making bite sized chunks and then going through trial phases, the fact that it was mainly industry led, the feel really responsible for the success of that trial and project. So that's something that we're really looking to replicate in the future, is paying more than, not saying that we have in the past necessarily, but more than the first co-design and we're really dedicated to it all the way through the process.

Jessica May: Wonderful. Thank you. So we might wrap up there. So thank you very much. Ley, Rob, Alejandro and Nicola. I'm sure, Richard is going to mention it, but just a plug for my team who are outside who are going to show you some of the work that we're doing as part of the innovation program and our pilots program. There's some amazing robot, so come out and say hello, but thank you so much everyone and thanks for having us.

Richard Morecroft: Thanks very much indeed, Jessica and our panellists and yes, indeed. I am going to mention those robots because we will be taking a little bit of a lunch break now for around about 45 minutes. Probably, if we can make sure that we're back in the room and ready to go by 1:50, that will be great.

[Lunch break]