



AG Tech and the Role of Extension

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A message from the APEN President

Dr Anthony Kachenko, APEN President

Hello everyone. I trust the year is off to a productive start and that you are safe and well. With recent floods across large expanses of Australia's east coast, some have had tears of joy with droughts broken whilst others have endured tears of pain with loss of infrastructure, livestock and human life. My thoughts and prayers for everyone impacted. We are a resilient nation, and I am certain we will come back stronger than ever before.

Since January, there has been a hive of activity within the APEN Board and through its Committees as we plan for the 2022 APEN International Conference in Melbourne. I am excited about the prospect of coming together face to face, strengthening our network and investing in our development. We are also going virtual to capture a wider audience and I encourage you to save the dates of February 9-11, 2022 in your diary.

The APEN Board is also working on finalising a professional membership category. This new category of membership

will provide greater recognition of APEN members skills, knowledge and experience in extension gained through ongoing professional experience and/or formal qualifications. Look out for this development in future updates as the program goes live on 1 July 2021.

I encourage you to keep up to date with APEN social media channels through Facebook, Twitter and on LinkedIn. I thank the APEN members who volunteer their time to ensure relevant content is shared across these social media channels. Personally, I enjoyed viewing the stories from several APEN members as to what extension means to them through the APEN Challenge on Facebook. Take a look yourself if you haven't done so already.

As always, please feel free to contact me directly anytime at president@apen.org.au or 0429 221 443 to share your thoughts on APEN.

Best wishes,

Dr Anthony Kachenko



Editorial – Connecting and Collaborating through Digital Technologies

Challenging the traditional legacy model Technological innovations have shaped agriculture as farmers overcome the challenges throughout time to be more productive and efficient. 2020 brought challenges from drought, floods, cyclones, fires. COVID-19 has changed our world and our industries. Connecting by distance became the "new norm". We needed digital technology to communicate and collaborate to keep our businesses alive. 'Resilience', 'Adoption' and 'Sustainability' become necessary buzz words.

Now we have digital agriculture. Sophisticated technologies, such as robots, GPS, aerial images are being used to make businesses more profitable, safer and more environmentally friendly.

In this issue of ExtensionNet, we share the creativity and innovative ideas and practice of how five different individuals and industries have adapted in this digital technological age.

- **Jen Medway's Ag Tech journey** shares five personal lessons to fuel her farm business – motivated from attending the 2020 evokeAG. conference, including: *"by not engaging in the wave of new technologies is to do our business a huge disservice and likely banish us back to the dark ages"*
- **Callen Thompson & Jill Kelly found podcasts a useful engagement tool** to inspire landholders to make changes in their business
- What is genomic testing you ask? Read the excellent article, **Genomic Testing a Game Changer for Australian Dairy Farms**, describing a project and case study in Victoria lead by **Dairy Australia and DataGene**
- **Chrissy Stokes** describes the the "rise and rise" of the use of a tool nobody knew they needed in the NZ kiwi industry in her very interesting article, **The Push and Pull of Technology**
- **The Gate initiative, Global Ag-tech Ecosystem**, was established by the NSW Department of Primary Industries to fast-track new ideas, technologies and services created by start-ups and by research teams for the benefit of primary producers and society by bringing non-traditional players with new perspectives into the market.

Such a wealth of creativity that *"New technologies can bring about both incremental and transformational changes to increase the profitability, sustainability and productivity of Australia's agriculture industry"* [The Future of Agricultural Technologies Report, (ACOLA, 2020)]

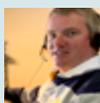
The ExtensionNet Editorial Team thank all the contributors in making this issue a very stimulating read!



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APEN Board News



The APEN Board has been preparing for a year of activities and a fantastic Conference in February 2022. Our five Committees have been very busy, including involving members to reflect the challenges they are facing, what activities they would like to see organised and how can they broaden and upskill extension facilitation. Our adaption skills have required us to be more resilient as we combine face-to-face and online events. Flexible work is possible! We have been extremely well supported by our dynamic Regional Coordinators.

available to members on our website. This is a very valuable tool to keep connected and network with our diverse membership. The *Shaping Change* resource and APEN's annual report, which have been sent as a hard copy to all new members, is now being provided as an electronic version. A hard copy, on request, will be supplied at the cost of postage. A tender call for APEN Admin Services is being finalised.



Audit, Risk and Financial Control Committee

'A good financial plan is a road map that shows us exactly how the choices we make today will affect our future'
(Alexa Von Tobe)

Times are very challenging as we continue to reassess our organisational action plan to monitor expenditure. In future, our Members' Directory, previously sent as a hard copy, will be



Governance and Strategy Committee

'A vision without a strategy remains an illusion.'

(Lee Bolman)

The purpose of the Governance and Strategy Committee is to ensure governance systems of APEN, including the governance policies and procedures underpinning the conduct of the functions of the organisation, comply with current regulatory requirements and reflect contemporary business, governance, policy and ethical requirements in Australia.

Progress over the last few months include the APEN Strategic Plan, a Board Charter (needed once the Constitution had been updated) an Exit Strategy (based on the Constitution regarding the compliance

between our company and ASIC), a Governance Calendar, review of our policies (based on Compliance, Culture, Strategy and Risk).



Business Development Committee

'Without continual growth and progress, such words as improvement, achievement, and success have no meaning.'

(Benjamin Franklin)

It is exciting to report the development of a Professional Membership. On 1 July 2021, APEN will introduce a **Professional Membership of APEN (APEN-PM)** in addition to the existing membership categories of: Ordinary, Student, Retiree, Overseas Affiliates, Corporate and Life membership. Professional Membership of APEN will bestow several additional benefits including:

- Recognition of your high level of skills, knowledge and experience in extension gained through professional experience and/or formal qualifications
- Recognition of your high level of commitment to ongoing professional development
- Recognition of your understanding of industry ethics and accountability
- The use of post nominal **APEN-PM**
- Exposure through a listing of skills in the APEN register which employers/funders can access (on the APEN website)

APEN has a long history of successfully staging an International Biennial Conference. After an EOI process, APEN is delighted that the Rural Research Group at the University of Melbourne has been successful in hosting the 2022 Conference in Melbourne as a face-to-face and on-line (virtual) conference, from 9-11 February. Watch this space!

APEN Board News



Stakeholder Engagement Committee

'Whatever words we utter should be chosen with care for people will hear them and be influenced by them for good or ill'

(Buddha)

APEN has a multi-channel approach to communications to support and engage with our members and our wider stakeholder group. Our Social Media will keep you updated. ExtensionChat and APEN Challenge #1, last year, saw huge

traffic passing through Facebook and Twitter. The 2021 APEN Challenge #2 is bringing in another cohort of members who are making an impact through their industries and workplaces. Our website continues to be refreshed. We will be widening our reach through our LinkedIn connections. The more feedback we receive the better our communications.

Don't forget to read our Monthly eBulletin. We do encourage members to send news, reports, events, etc., to info@apen.org.au – all with the aim of extending your horizons!

The Stakeholder Engagement team have appreciated the enormous effort from so many people as we endeavour to reach, engage and share the activities and achievements of our network of amazing extensionists.

Regional Activities Committee



"The strength of the team is each individual member. The strength of each member is the team"

(Phil Jackson)

While working closely with the APEN Board, our main role is to reach and engage our members and the wider community

- to facilitate and/or coordinate regional activities
- to gather feedback from our communities to inform and advise the Board on issues and interests that need to be addressed. **Read Around the Regions**, in this issue, to keep up to date with what is happening in your region.

All of our core business can be achieved because of members' commitments and loyalty to our organisation.

Are you interested in growing our business through joining one of our Board Committees?



APEN Directors would like more of our Members to be involved in each of our Committees.

We encourage you to select a Committee and send us an Expression of Interest to info@apen.org.au

1. In your response, please outline: (400 words max.)
 - why you want to be involved
 - attributes, interests and skills you can bring to a task force
2. We are looking for committed members
3. The term of appointment is two years, and the committee meets at least four (4) times per year.

APEN 2022 CONFERENCE



Facilitating Change and the Opportunity from Disruption.

SAVE THE DATE

2022 APEN INTERNATIONAL CONFERENCE

9 – 11 February, Melbourne, Victoria

Don't miss this unique opportunity to share knowledge, learn new skills, network and be inspired in your extension role.

The APEN Conference, hosted by the University of Melbourne will be an international meeting for rural and community advisory practitioners, researchers, and academics who combine the best extension research and practice from developing and developed countries.

An unmissable opportunity to hear from leading experts, thought leaders and industry professionals in an unforgettable destination.

Find out more: www.apen.org.au



Sponsorships Available!
Contact: Rosemary Currie
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ENET

Technology Fuelled Farm Businesses: Five lessons from our Ag Tech journey

Jen Medway

Jen Medway has a unique perspective on agricultural innovation, as a successful sheep producer from Gunning, NSW as well as Senior Manager at AgriFutures Australia, involved in cross-industry research and Ag Tech ecosystems

evoke^{AG.}

Attending evokeAG. last year cemented the concept we hear daily that technology is driving the next revolution in Australian Agriculture. I am literally surrounded by information on technology—drones, precision agriculture, robotics, sensors, 3D printing, genomics, IoT, biotechnology, autonomous vehicles... just to scratch the surface.

As a fifth-generation farmer helping to run our wool and sheepmeat enterprise at Gunning, NSW, like many generations before me, I am asking the question of how we can pivot our business to remain on the cutting edge.

How can our farm business continue to innovate and remain profitable and sustainable in an unpredictable and often hostile ag sector?

My day job as Senior Manager of Business Development at AgriFutures Australia, one of 15 Rural Research and Development Corporations, has opened my eyes to a myriad of opportunities for farmers to adopt new technologies and innovations. In fact, I constantly hear that to not engage in the wave of new technologies is to do our business a huge disservice and likely banish us back to the dark ages.

So, I started to work my way through opportunities for our farm business. As a livestock producer, we started to think about investments we could make to create a step change in the trajectory of our business—not a little bump in the road that would be absorbed into general revenue, but technology investments that would enable us to generate significant returns.

What I found was a lot of soil mapping and monitoring technology and robotics that have the potential to be game changers for the cropping sector. I found a lot of technology that saved time—for instance, drones that could check troughs or tank sensors for monitoring water levels. I found technologies that could connect me to my consumer through QR-codes and apps that could improve our stocking rate and help with my business reporting.

I realised that like many farmers I was looking at technology as a magic bullet to



a problem that I hadn't fully realised. What I mean is that technology is not a means to an end. Attending evokeAG. last year, a speaker so eloquently put it that a bad producer cannot uptake technology and suddenly become a good producer.

But, did my experience match that of my farming peers? Well yes! We have all heard stories of farmers who had big plans to use their shiny new drone to achieve yield mapping, weed identification and 'see lice on a sheep's back'. After a month or so, that investment often turns out to be a cool camera that enables farmers to take great shots and up the ante on their social media profile.

What I realised was that I was short on practical pathways and examples of how we could use technology to make our thriving business better—case studies of producers who had leapt in, made the tech investment and were now reaping the rewards of a more profitable and productive business. I was missing access to tools to understand the return on investment (ROI) that would create a line of sight from initial investment to financial reward.

Was I asking the right question? Like many others, jumping to technology to solve an ill-defined problem is not the answer. After some soul searching, I realised that we needed to clearly define the problem or opportunity for our farm business that technology has the potential to solve. And voila, the tech solution was staring us in the face.

So, what have we learnt, a couple of things...?

1. Technology can't provide a solution to a question you don't know you are asking. A shiny gadget, a new piece of machinery or a 'smarter' way of doing things won't in itself deliver your business gains.
2. Get your house in order by critically analysing your business' strengths and weaknesses and invest in technologies that can negate risks or strengthen your overall business position.
3. Do the work to identify technologies that answer the right question and fit your production system.
4. Don't overinvest and start simple!
5. Do your homework and sums and look for novel ways to use a piece of technology to add additional ROI to your investment.

If everything comes together and the seasons are a little kinder, hopefully you can create your own step change towards a technology fuelled profitable farm enterprise. For our business, we are only part way through this journey, but so far, we seem to be heading in the right direction!

Jen's LinkedIn profile: <https://www.linkedin.com/in/jennifarmedway/>

ENET

Podcasts, a useful engagement tool?

Callen Thompson

Mixed Farming Advisor, Central West Local Land Services



Central West Local Land Services (CWLLS) has been engaging with their producers through podcasts for the last six months. The podcast series has been successful at engaging listeners, which we have attributed to having a formal plan, using interesting and inspiring talent and maintaining a high quality of production. The premise for the show is CWLLS staff talking to producers who have made changes in their business.

Our journey started just after the APEN conference in Darwin, my colleague and fellow interviewer, Jill Kelly and I had been speaking about different podcasts we enjoy, and we decided that podcasts would be a good way to inspire landholders to make change in their business, at that stage around the management of drought. We both had examples of producers who we had learnt a lot from, but that without the context of their story, we struggled to transfer these learnings to other producers.

At the time I was working on a project plan for a funding body and thought, “podcasts can’t be that hard to develop” so I put them in the deliverable outputs. I then investigated making podcasts and quickly realised it was not going to be as easy as I thought.

The first real step we took was probably the most important one. We realised that we did not have the technical skills to produce, market and distribute a podcast, so we engaged a company that specialises in podcast production.

The company we engaged worked with us to refine our ideas into a formalised plan. This involved creating clear objectives, identifying the target listener, setting out a format and tone and working out the length and frequency of our episodes.

Our objectives were to:

1. Educate, inspire and empower farmers to take action and make changes in their business
2. Build the brand and reputation of LLS
3. Showcase the expertise of LLS expert staff
4. Generate leads to other relevant LLS content

The topics we spoke on are as varied as our producers, so we did not put a focus on particular industries or production systems. We wanted stories from producers who have been through change in their business. We also wanted to focus on creating an enjoyable experience for the listener through storytelling and peer-to-peer learning, rather than having an expert conduct a lecture.

Our target listeners were primarily farmers aged between 20 and 50. We were targeting early to midterm adopters, who were open to making change. We also wanted to reach other stakeholders like advisors, other government agencies, media and our own staff.

We thought the interviewers should have primary production knowledge so the team suggested that Jill, who is a vet and myself conduct the interviews. To create consistency we decided that having one person do every intro and outro would be best. For this job we selected Neroli Brennan, our team leader for Ag Advisory, mainly because she has a great voice for radio as well as strong subject knowledge. Because consistency is so important, we decided to release once a fortnight. This meant that we could release regularly, but still have time to interview, produce and promote each episode.

The duration was set at 20-30mins. The reason for this is that research conducted by the podcast company showed that any longer, and people may lose interest. We also decided that if they were shorter our listeners would get frustrated having to change episodes too often. We also thought that the average trip to town was also about half an hour in much of our region.

The company we used provided Jill Neroli and me with recording equipment and associated training, advice on how to prepare for an interview and how to conduct an interview. As I said, we wanted the interview to be conversational, but for that to work you have to have a plan and a few tricks up your sleeve, if the conversation is not going where you want it.

So far, the podcast has been a very positive experience. We have had over 5000 individual downloads and our first episode spent weeks in the top 10 Australian educational podcasts on the Apple podcast platform. The feedback we are getting from our producers and stakeholders has also been very positive, in fact I have been at social events with a group of farmers standing around discussing what they have learnt from the podcast, without any initiation from me.

We believe this is a very cost-effective option to engage with our producers. With our current download numbers, it has cost us approximately four dollars for each individual 30 min episode download. This is reasonably cheap considering if I were to run a field walk, it would cost around fifteen dollars to provide each attendee with smoko. The time taken and travel to record our episodes is not taken into account with this cost, but generally, most of the interviews are conducted as part of doing my day job. One of next areas of focus is better measuring our impact. We know how many downloads we get, but we don’t know if our listeners are making changes because of our podcast. We aim to conduct a survey in the coming year to try and understand if we are getting an impact.

So if you are thinking about starting your own podcast, my advice is to consider engaging a professional and make sure the audio quality is high. **If you would like to listen to our podcast, search for “Seeds for Success” on your favourite podcast platform.**

Genomic Testing a Game Changer for Australian Dairy Farms

This case study was created by DataGene.

When we think of Ag Tech, we often think of drones, virtual fencing or self-driving tractors, but there is other less known agricultural technology that has the potential to not only enhance the productivity and profitability of individual dairy farm businesses through informed decision making about their herd but to also enable a quantum leap in genetic gain in the Australian dairy herd. What technology are we referring to? Genomic testing of female calves.

But what is genomic testing you ask? Genomic testing is the process of analysing a DNA sample (ear tissue or tail hair sample) from a heifer to reliably predict her future performance in several areas. This test can be done as early as birth to give farmers important data to make decisions about their heifer calves.

A project lead by Dairy Australia and DataGene aims to significantly increase uptake of genomic testing of heifers so that it becomes a routine practice on most Australian dairy farms. A key part of the project is collaboration with trusted advisors who influence farmers' breeding decisions including genomic service providers, herd improvement companies, breeding consultants, fertility advisors, milk processors, stock agents and Dairy Australia's Regional Teams through communications, extension and learning opportunities.

The project aims to use a comprehensive communication and extension campaign to raise awareness of the benefits of heifer genomic testing and assist farmers to make informed decisions using their results. Through embedding key information, case studies and testimonials into current animal performance related Dairy Australia extension activities, prioritising farmer testimonials at general farm open days, specific genomic awareness activities and farmer discussion forums are just some of the approaches this campaign looks to include to ensure this technology is widely adopted.



Retaining a group of heifers, originally earmarked for the export market, helped Huw Evans conduct his own experiment on the value of genomics.

Case Study:

Genomics guide decisions for Gippsland family farm

Dairy Business: Evans Family

Region: Gippsland, Victoria

Retaining a group of heifers, originally earmarked for the export market, unwittingly helped one Gippsland dairy farmer conduct his own experiment on the value of genomics. Four years ago, Huw Evans and his family took samples from 80 heifers for their first try at genomic testing. It was also the first year the family operation at Wuk Wuk near Lindenow had generated surplus heifers and they wanted to be sure they were keeping their best animals as replacements. The genomic results listed the heifers from lowest to highest according to their Balanced Performance Index (BPI), the Australian measure of a cow's genetic merit for the traits that contribute to a dairy farm business.

The family 'tagged' the 15 lowest BPI animals and those that ranked poorly for fertility and cell count for sale to the export market. But the heifers never actually left the farm. "The agents couldn't tell me when they were actually going on the boat," Huw said. "It got to joining time and I said, 'can you actually tell me when they are going on the boat?'. They couldn't so I said, 'fine, I will join them and keep them'. "That group

are now only on their second lactation and we only have one or two of them left in the herd. There were a number that didn't get in calf originally or they have just dropped off really quickly compared to the others."

Admitting this accidental genomic experiment probably wasn't a big enough sample size to draw widespread conclusions, Huw said the noticeable results during the past few years reinforced the value of herd data and helped clarify a future breeding plan for the herd. Genomics also provided a focus for Huw and his family during the recent years of drought in East Gippsland and periods of low farmgate milk prices. "It gave us something that we felt like we had control over and that we could make steady improvements," he said. "It has certainly given us a sense of achievement during tough years." Thanks to genomic data, the Evans family also now have more confidence using sexed semen to make the most of their genetically superior animals and beef semen to diversify their income and reduce their workload. "At first we used sexed semen to breed extra heifers but now having a bit more data on those in our herd, we are utilising that genomic information to get better calves, by focusing on the better cows in the herd," Huw said.

The Push and Pull Of Technology

Chrissy Stokes

In the kiwifruit industry, understanding how much crop we have to sell is really important. It informs how much packaging needs to be manufactured, and with a significant lead time this is no small matter. It helps set pricing in the markets – if we know the crop will be small, prices tend to be higher, while if there is a large crop, we need to move fruit faster and so price it lower. If we end up with a lot more or less fruit than anticipated, we've either got an uphill battle to move it all without reducing the price, or we've given away some of our potential returns, all of which flows on to growers and their bottom lines. It informs our shipping plans, and it informs the investment decisions of post-harvest operators – cool storage space is expensive and not utilized for much of the year so if you don't need it, you won't build it.

The annual crop estimation process is a complicated one. Each of the post-harvest operators surveys a range of the orchards they have an agreement to pack, and forecasts are developed to estimate both fruit numbers (how many fruit per m² of canopy) and fruit size, which combine to give a yield per hectare. This is usually accomplished by manually counting the fruit on five monitor bays (a bay is the area between four posts, and the basic unit of production in a kiwifruit orchard) on an orchard and forecasting final fruit size using industry multipliers. This is a hugely time-intensive process and give that there are approximately 400 bays/ha, a very small sample size. Kiwifruit vines are inherently highly variable, and the difference in croploads can be significant across a block (**Figure 1**).

A few years ago, I stood in front of kiwifruit growers and talked about an exciting new project our Innovation team were working on, to develop a tool for digital crop estimation. Zespri, which is a marketing company responsible for exporting and marketing all of New Zealand's kiwifruit crop (with some small exceptions) has funded this project, because the cost of getting the crop estimate wrong runs into the millions of dollars each season, not to mention the headaches it causes. The "tool" is effectively a series of cameras and sensors attached to a vehicle. Driven through an orchard, it collects a series of images which are then processed and some complicated algorithms run in the background to decide what's a fruit (and what's not). This is all technology that other industries have used, and the complicated element is that it's really important to

know the size of the area the images cover – because these numbers are then multiplied up. In effect this give the ability to cover a much larger area of production. One hectare can be imaged in about 15 minutes, which using the manual system would be enough time to cover around 2 bays (or about 50m²).

Growers got excited about this, because they could immediately see the potential benefit for their own operations. Thinning a kiwifruit is a manual job. Workers come in and are instructed to thin a crop down to a particular number of fruit per m². This might be a very simple and quick job if the crop there is just above the target load, or it can be a very slow and laborious task requiring the removal of 50% of the fruit that's there. Having an image showing which bays have heavy crop loads and which are close to the target already means that all of a sudden you can target labour, (which is scarce and expensive) to the areas that most need it in the orchard, and the areas that don't need it can be left alone, or a different instruction given.

We kept being asked 'When will I be able to use this?', 'Can I buy a unit?', 'How long do I have to wait?' We had to let them down, when the decision was made in the business that the focus was going to be on covering a large area, but to generate average crop load values only. In the end,

we need a single multiplier to add to the crop estimate calculation. For a grower though what's important is the variation in crop load across their orchard, and where those areas are that need focus.

There was a huge pull from industry – this was one of those technologies that required almost zero "push" from an extension perspective. We're now seeing, three years on, commercial crop scanning available for growers, with next day reporting. They get a heat map showing relative crop density, and lots of other useful data to help make timely decisions. Essentially the technology is pretty similar, but our project has moved on to now working out how to estimate fruit size, because that's the other critical component in the crop estimation process. Meanwhile, growers are able to make timely decisions on thinning and cropload management and save money by deploying people only where they're needed.

This is an interesting example of a pull for technology. Growers could straight away see the potential of this tool, but it actually wasn't capable of (or designed for) doing the job they wanted. Very quickly other providers have stepped into the gap created and delivered a solution that does a pretty good job – and we're seeing the rise and rise of the use of a tool nobody knew they needed.



$$\frac{\text{Fruit per m}^2 * 10,000\text{m}^2}{\text{fruitsize}} = \text{yield per hectare}$$

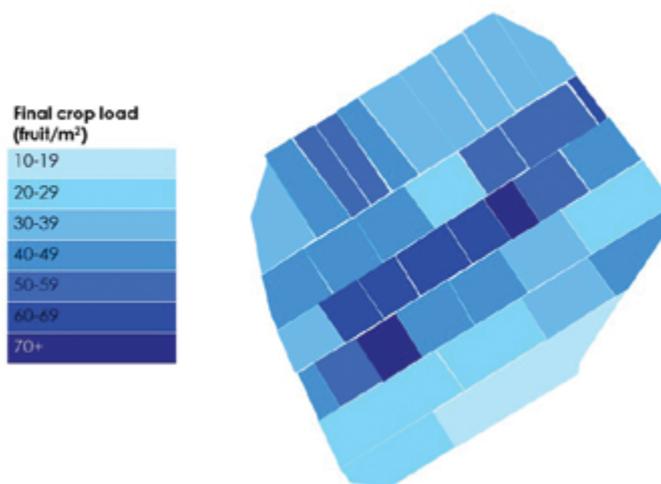


Figure 1. Yield data by area captured at harvest shows a huge variation in cropload across a production block.

The GATE Initiative

Ag-tech on farms is not new and there are producers and technology innovators driving this. What we focus on is using ag-tech as a catalyst for transforming agriculture and solving those whole of industry issues that we see on the horizon.

In 2018, the NSW Department of Primary Industries created an unprecedented initiative called -The GATE – Global Ag-tech Ecosystem.

The GATE was established to fast-track new ideas, technologies and services created by start-ups and by research teams for the benefit of primary producers and society. Based at the Orange Agricultural Institute, it provides a support service to entrepreneurs and helps researchers communicate and develop customer orientated products to maximise adoption and extension.

The GATE arose as a unique partnership between DPI, the RDCs for Horticulture and Cotton as well as global venture capital provider SparkLabs Cultiv8. Three years on, with the partnership now including the Fisheries RDC, the results are landing with more than 50 businesses/research teams through the program, attracting over \$80million in follow on funding and generating over 100 Australian jobs.

“The GATE is not your ordinary start up supporter. Our perspective goes beyond whether an idea will provide a good return on investment,” says Carolynne James, GATE Manager.

“We take our own research products and use commercial disciplines and enhanced understanding of customers to make sure research is adopted in the widest possible way.

“For example, the DPI developed a free app called the Drought Feed Calculator. This was created to help drought affected farmers select optimal feed combinations. While this dealt with an immediate need for the producers and assisted in animal welfare management, once out in the



market, the true value of this app was really appreciated.

“The Drought Feed Calculator actually consolidates over 20 years of DPI’s world leading animal research into the hands of farmers in a tool that is powerful and practical. We realised farmers can use this tool all the time and in 2020 we expanded its functionality and relaunched the app as the Drought and Supplementary Feed Calculator. We know this translates into better more sustainable animal management practices with over 25,000 downloads of the app in Australia and internationally.”

The GATE and partners are also supporting projects that impact across multiple commodities and production systems. Lack of connectivity is the most obvious constraint to adoption of tech on farm. In association with Department of Regional NSW, the DPI has established Farms of the Future which tackles connectivity and usability issues across three sample sites in NSW. This assists farmers to evaluate and see real life implementation of technologies.

“We see ag-tech as a delivery vehicle for ideas underpinned by science,” says Bruce Finney DPI Group Director, Innovation and Business Development. “A drone may be able to gather crop data on growth, soils, and condition but interpreting that data and converting that into a meaningful management response is dependent on underlying research and understanding of production systems.”

The DPI has over 600 researchers and is consistently ranked in the top 1% of institutions globally in the fields of research of plant & animal sciences, agricultural science and environment & ecology. We are uniquely placed to support projects in emerging industries from bio-herbicides,

diagnostics to insect production to ensure project development is of a high quality and negative consequences are mitigated. Our program dips into our own in-house expertise to identify those key public good issues such as biosecurity, animal welfare and sustainability are examined in project development. This in turn ensures projects not only meet the needs of the producer but the industry as a whole.

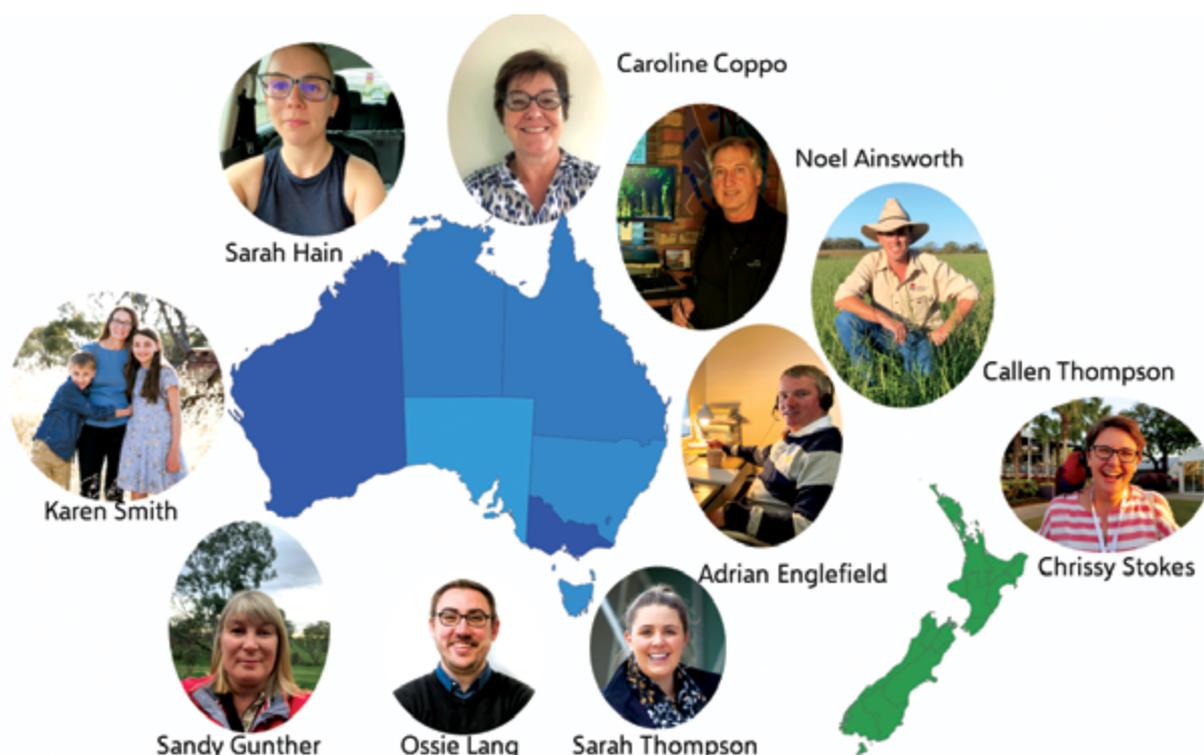
As Bruce explains “for example, through the GATE, DPI sheep researcher Dr Gordon Refshauge has developed a tech device to standardise sheep condition scoring, and this will be commercialised with a global partner. The value of this device is obvious for better animal assessment and ease of measurement on farm - but there is more to it. Combined with other animal tracking technologies, the data from the sheep scoring can be potentially correlated against animal activities and feeding patterns. Ultimately this will provide a richer platform for further research into optimal sheep production activities that can assist the whole of the industry”.

The GATE brings non-traditional players with new perspectives into the market. Our partnership with SparkLabs Cultiv8, is able to assist teams access technology investors and cross discipline knowledge to projects. The GATE and Sparklabs Cultiv8 host an annual Demo Day, which has the largest participation in Australia, to showcase ideas to these new collaborators and investors in the agricultural sector.

In 2021 the GATE services are expanding to offer more collaboration opportunities to RDCs, the private sector and start-ups on the DPI’s 22 research stations around NSW.

For more information on the GATE and its projects go to www.thegate.org.au

Around the Regions



Chrissy Stokes New Zealand

New Zealand's recognised seasonal employer (RSE) scheme allows the horticulture and viticulture industries to recruit up to 14,400 workers from overseas (mostly from Pacific Islands) for up to seven months for seasonal work when there are not enough New Zealand workers.

COVID-19 meant that rather than returning home, many RSE workers stayed in New Zealand, and it's been hard to get them back. 2000 spots were made available in managed isolation, with employers required to cover this cost along with the cost of flights, increased hourly wages, and pastoral care. Industries are screaming out for workers, and while the harvest period is stressful, we can see an even bigger challenge approaching with the requirement for skilled labour for winter pruning. We can expect this to drive investment in technology and innovation which will provide some solutions in the medium term.

While there, the scheme has huge benefits for New Zealand growers and industries, wages provide a "safety net" to meet basic needs when resource-based livelihoods are less productive

due to extreme weather events or longer-term climate trends. What the immediate future holds for these countries and their workers remains to be seen.

Callen Thompson New South Wales

As we move into autumn, northern NSW cropping producers are getting ready for winter crop planting. Graziers are also getting ready to sow forage crops. Producers who have managed their fallows well will have good soil moisture for sowing but are worried about how much seed sown will establish!

Mice numbers have increased due to favourable conditions for breeding. With plenty of food and ideal habitat mice can do a large amount of damage to an emerging crop. There are management options and extension officers along with agronomists are working hard to get this message out.

Further information – NSW Local Land Services [Managing mice at sowing](#)

On the Ag tech front, I have been involved in recording podcasts over the last six months. We have been interviewing farmers and sharing their stories, experience, and learnings with the wider farming community. Receiving positive feedback from listeners, the

team found podcasts to be a cost-effective way of engaging producers. If you are looking for a new podcast to listen to, *check out "Seeds for Success" or the LLS podcast article in this edition.*

Adrian Englefield New South Wales

What a relief it is to be able to travel to industry extension events. For those of you following APEN on Twitter, I have recently posted some updates from my travels. My role at Hort Innovation has recently seen me travel to Western Sydney, the Goulburn Valley, Riverina and Orange, meeting with many industries and hearing about their challenges and opportunities (especially due to COVID-19).

With Hort sector labour shortages, opportunities to further develop robotic harvesting will only increase. I met



with Ripe Robotics who are developing automated fruit harvesters. And the use of harvesting platforms and orchard design to maximise labour efficiency was a hot topic at the recent [Future Orchards](#) – Apple and Pear extension workshops (pictured Shepparton).

I also met with the NSW Department of Primary Industries G.A.T.E. team in Orange. G.A.T.E. (or Global Ag Tech Ecosystem) is an ag tech incubator program. In 2019, I participated in the program and pitched at the demo day to develop an on-line extension platform – [please see the videos of the G.A.T.E.'s current projects](#), there are some really interesting things happening in the Ag Tech space!!!

A deep dive into Ag Tech or Tech incubator programs will demonstrate many other developments in the Ag Tech space. Some of interest to me include:

- [EvokeAg](#)
- Charles Sturt University [Innovation Hub](#)
- [Sprout X](#)
- University of Sydney [Incubate](#)
- [Canberra Innovation Network](#).

Sarah Hain Northern Territory

Established relationships, such as those between growers and extension officers, can reduce the fear of implementing technology in farm businesses and is essential to adoption. In the Northern Territory, technology is a key component in projects such as real time water use monitoring in vegetables and mango crop forecasting via free satellite imagery and like many rural and remote areas, poor connectivity is a defining constraint of technology adoption. Extension officers can help to highlight and provide feedback where connectivity infrastructure is inhibiting uptake of technology.

Many technologies are sold to growers as a silver bullet, but Extension Officers can assist with bridging the divide of maintenance and calibration between the purchase and in field use of these technologies such as the near infrared testing for fruit maturity or retrofitting equipment before harvest. It may also require some retrofitting of growers' mindsets before widespread adoption takes place. Getting the basics right ensures a solid foundation for technology to add value to

an enterprise.

Irrigation Australia, hosted by Australian Mangoes, NT Farmers Association and the Northern Territory Government, held irrigation masterclass workshops in Darwin and Katherine, on 23 and 25 March respectively, to ensure growers have a solid foundation of best practice to underlie any implementation of irrigation and water use monitoring technology.

Noel Ainsworth South Queensland

It's like spring for extensionists in South Queensland with the increasing prospect of face-to-face meetings and field days in the air. Aside from the challenges of rescheduling face to face meetings, hopefully the frequency and length of lockdowns will reduce those risks going forward. It has been interesting watching extensionists simultaneously combining in-person with virtual meetings and finishing seeking a mix of hard copy and virtual Survey Monkey feedback. Still juggling and balancing while facilitating a constructive discussion!

I have also experienced challenges while evaluating Ag Tech. Challenges include understanding what the Ag Tech can offer, and further understandings associated with efficiently handling the data and converting into on-the-go decisions. I would also like to acknowledge the Hort Innovation Extension and adoption facilitators, who have been active consulting horticultural extensionists in Qld how they might offer support into the future.

As a parting note I would like to offer a shout-out to all the APEN mentees and mentors putting themselves forward to shake it up for 2021.

Sandy Gunter South Australia

In South Australia, Ag related field days, workshops and other farmer-based events have returned. Regenerative farming is gaining momentum as a topic of interest, with two "Grazing Naturally" workshops scheduled at Taillem Bend. The events include presentations from [Dick Richardson](#) (pictured next column) that have land managers attending from the Mallee, the South East, the Adelaide Hills and Kangaroo Island. It is looking like a state-wide networking group for regenerative agriculture will be formed



with regional sub-groups.

Further information – [Grazing naturally](#)

The Karoonda Farm Fair is going ahead this year, to be held on 9–10 April 2021.

Several of the landscape boards in SA have small grant schemes open to farmer groups for projects to develop skills and knowledge for sustainable agricultural enterprises. Each landscape region runs its own small grant scheme; priorities for each region may vary.

[Limestone Coast region](#) – opens 5 March and closes 19 April 2021

[Murraylands and Riverland region](#) – opens 15 March and closes 12 April 2021

[Northern and Yorke region](#) – small grants open all year round based on funding availability.

The small grants schemes for Kangaroo Island, Hills and Fleurieu, Eyre Peninsula and SA Arid lands Landscape Boards are currently closed.

Ossie Lang Tasmania

I am an organising committee member for the annual Ag innovation day to be held in March. Held at the Hagley Farm School, the day highlights how new technologies can benefit growers. While this event is important in demonstrating changes through Ag innovation, extension continues to play a vital role in ensuring technology is adopted in line with best practice and utilised effectively.

One such extension program in Tasmania has been the Tasmanian Institute of Agriculture (TIA) *Water for Profit* program (pictured). With irrigators springing up around the state nearly as



quickly as the crops beneath them, the state Government recognised there was a risk the water resources may be less efficient in under-performing irrigation setups. The Water for Profit program brought growers and experts together to ensure that irrigators were performing at the optimum levels and that the water resources, that had been heavily invested in, were utilised in an efficient and profitable manner.

This program highlighted that while new technology is great, ongoing extension and support is needed to ensure the benefits promised with the new technologies are achieved.

Further information TIA [Water for profit program](#).

Sarah Thompson Victoria

The start to 2021 has seen both Victorian extension practitioners and farmers making up for the lack of in-person engagement during 2020. Starting the year with a bang, we are enjoying being able to get back out on farm and into venues to learn, network, discuss and share ideas with each other in the flesh rather than over a screen.

Ag Tech is the focus of this ExtensionNet which aligns to many extension activities across the state. There is a buzz of excitement around the concept, and it is great to see extension approaches delving into how these new technologies can make a difference at a farm business level including how to practically use data and inform business decision making. A project focusing specifically on the

use of technology in the dairy industry was undertaken in NSW called the TechKISS (pictured - below). The idea behind the project was to identify and share key elements for successful technology use for individual cow management; with a focus on auto-drafting, computerised bail feeding, in-line milk metering and activity meters.

Further information: Harris Park Group [TechKiss](#).

Karen Smith Western Australia

The remoteness of WA from the rest of the world has become our strength, ensuring life has very much returned to normal in our COVID-19 free bubble. After the challenging 2020 year, even after a small blip at the start of February to keep everyone mask & toilet paper ready in the event of a lockdown, public health management in WA has provided confidence to community to proceed as normal, but always with a back-up plan.

The unfortunate blip around 1 February timed well to disrupt one to the very first extension events aimed at livestock advisors on the road to meet in Fremantle for the “[Great Livestock Industry Day Out](#)” at the 33rd Australian Association of Animal Sciences Conference. The back-up planning going into running events of this nature was evident as attendees were notified and quickly converted to all online sessions only. After five days of lockdown industry extension events have continued on through this busy period.

The GRDC Grains Research Updates have been held for advisors and farmers, along with Pre-Season Update sessions of local Grower Group organisations throughout February and March. An Ag Extension Skills Program has also started in an online format to up-skill Grower Group staff in WA facilitated by Jeanette Long as part of an Australian Government initiative.

2020 has provided a much-needed silver lining in the acceptance of online formats as part of delivery and participation in extension. The cost saving in time and fuel alone is enough of a difference in getting on with daily tasks, but the change in cultural norm to conduct work in this way provides many benefits, including people asking for help or having a go. Online does not replace in-person catch-ups to strengthen working relationships, just makes them more valuable!



Highlights from our Network

2021 APEN Webinar Series

The first in our series of 2021 webinars was delivered by Professor Geoff Cockfield on Monday 15 February.

Understanding farmer decision-making (and thereby reducing waste in agricultural research funding)

Professor Geoff Cockfield

Agricultural research funding agencies wish to maximise rates of adoption of technologies and management practices that show evidence of benefit to farm business profit and resilience. Yet the rate, pace and forms of adoption of outputs combine to suggest low rates of returns on public investment in such research and extension, at least in the short to medium term. Apparent non-adoption, dis-adoption and 'mal-adoption' of proposed innovations and decision-support tools, have led to a range of studies that try to explain why farmers don't adopt things that 'should be good for them'.

Professor Cockfield's presentation, available on the [webinar page on the APEN website](#), is a report on two studies of dairy farmers' decision-making that draw on previous work, especially in relation to social identity and learning preferences, with the addition of insights from studies of cognition. One study was of on-farm decisions around cow feed management and the other was of

farm business decision-making. From these studies, the results from interviews with farmers and service providers suggest that farmers rely heavily on intuition and heuristics, with very little use of decision-support tools and even basic, formal economic analyses when considering changes to farm systems and management. Decisions are hedged by personal work preferences and social and occupational identity.

The presentation concludes with some ideas on how research and extension outputs could be better framed for the actual rather than theoretical decision-making context. Limitations of these studies are noted.

Professor Geoff Cockfield is Honorary Professor in the Centre for Sustainable Agricultural Systems and the Rural Economies Centre of Excellence at the University of Southern Queensland (USQ).

He worked in agriculture and rural journalism before starting an academic

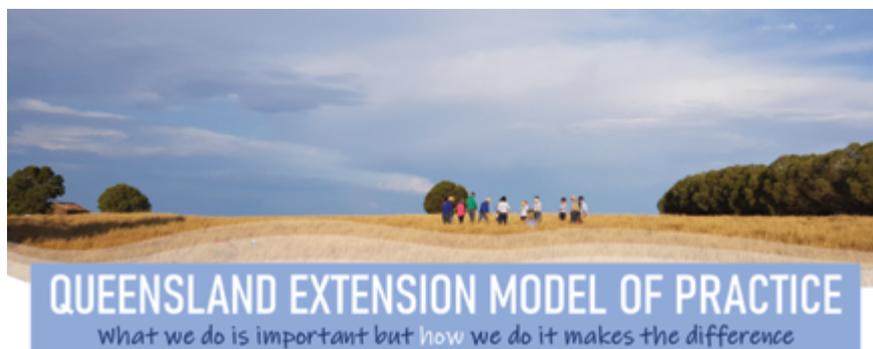


career (USQ). He taught public policy, environmental policy and economics and held a number of leadership roles in faculties and research centres and institutes. He was the 2018-19 Fulbright Distinguished Chair in Agriculture and Life Sciences at Kansas State University, where he worked on a comparative study of US and Australian agricultural policy. Recent research projects include the economics of soil improvement treatments, assessing the adoptability of soil treatments and cognitive perspectives on farm business decision-making.

The second in our series of 2021 webinars was delivered by Angela Williams, Canegrowers Isis on Monday 19 April, and is available through the [webinar page on the APEN website](#).

Angela Williams is an Extension Practitioner with 30 years cross industry experience in Soil Conservation, Agroforestry, Landcare and a number of agricultural industries including sugar, grazing and cropping. She has worked for ten years in both the community sector and private practice and also has had a background in Landcare, Catchment Management and Natural Resource Management.

Angela is passionate about agriculture and how authentic relationships with farming families are built and maintained to work to support practice change. Her true heart belongs in extension, working with farmers every day.



Presenter: Angela Williams, Canegrowers Isis



APEN Webinar
19th April, 2021

2021 APEN Mentoring Scheme

Facilitator, Jeanette Gellard (APEN Vice-President), inducted, via Zoom Meetings, the Mentor and Mentee participants of the 2021 APEN Mentoring Scheme on Wednesday 17 March. Over many years, feedback from Mentees and Mentors have indicated their positive experiences and how much it has helped them in their journey.

Visit the [Mentoring page on the APEN website for details](#).

More information:

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ExtensionChat APEN Online

Four great sessions were held in September 2020:

- What's new in extension (and how to use it to improve the effectiveness of your work) – Dr John James, Enablers of Change (1 September 2020)
- Evaluating extension: why you should fund my (next) project – Dr Jeff Coutts, Coutts J&R (8 September 2020)
- Supporting change – the holy grail of extension – Denise Bewsell, Red Meat for Profit (15 September 2020)
- Facilitating Tips & Tools – Jeanette Long, Ag Consulting Co (22 September 2020)

Registration included a copy of the recording of the session(s).

***** If you didn't register and you wish to purchase a copy of the presentation recording(s) – visit the [APEN Shop online for details](#).



Hort Connections – Celebrating the international year of fruits and vegetables

Visit the website for information: <https://www.hortconnections.com.au/>

If you can go, select APEN as the industry partner when you register. Thanks.

XV World Congress of Rural Sociology postponed from 2021 to 2022

The Congress will be held 19-22 July 2022 in Cairns, capital of Tropical North Queensland and gateway to the Great Barrier Reef and Wet Tropics World Heritage Areas.

- The conference website is live at <https://www.irs2022.com/> with more detail being added regularly.
- The abstract management system is open and accepting new submissions.

Registrations are open.

Murray-Darling Basin Plan - released

The ACCC has released its [final report into Murray-Darling Basin Plan](#) after it was directed to conduct an inquiry into tradeable water rights. The report outlines 29 recommendations in total and [stresses the need for comprehensive and focused reform of the Murray-Darling Basin Plan's water markets](#). [Source National Farmers Federation]



APEN International Conference 9-11 February 2022

We are looking forward to catching up with Members in Melbourne



"25 Years & Flourishing"

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Together, we have the power to inspire, connect and deliver on new opportunities and rich experiences that can open doors to innovation and progress while growing global economies and increasing well-being (Tae Yoo)

Guidelines and Deadlines

Submissions should be made in MS Word with minimal formatting. A portrait photograph of the author is required. All photographs, figures and/or tables ought to be provided as separate files (preferably TIF or JPEG; photos scanned at 300 dpi). Feature articles should be around 1000 words and minor articles 500 words. The editor reserves the right to edit submitted material to meet space restrictions. Letters to the editor or general items of news of interest to the network are welcome. Articles should be submitted at least four weeks prior to publication.

Preference is given to articles that are grounded in some form of project or event.

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Opinions expressed in ExtensionNet are not necessarily those of the Australasia-Pacific Extension Network (Ltd.) unless otherwise stated.

Stories and photos (next edition) due to Editor June 2021.