



17 January 2020

Senator Andrew Bragg
Chair, Senate Select Committee on Financial Technology and Regulatory Technology
Department of the Senate PO Box 6100
Parliament House
CANBERRA ACT 2600

Via email: fintech.sen@aph.gov.au

Dear Chair,

RE: Senate inquiry into financial technology and regulatory technology

The National Farmers' Federation (NFF) welcomes the opportunity to provide a submission to the Senate Select Committee on Financial Technology and Regulatory Technology inquiry.

The NFF was established in 1979 as the national peak body representing farmers and the agriculture sector more broadly, across Australia. The NFF's membership comprises all of Australia's major agricultural commodities across the breadth and the length of the supply chain, including live export. Operating under a federated structure, individual farmers join their respective state farm organisation and/or national commodity council. These organisations form the NFF.

The development and adoption of technology has long underpinned growth and sustainability improvements in Australia's primary production sector. More rapid and focused development and adoption of technology – including digital innovations – by farm businesses and supply chain participants will be critical to maintain Australia's competitive advantage in food and fibre markets and to deliver on consumer demands. Development and adoption of new technologies will also be central to achieving the NFF's vision of a \$100 billion agriculture sector by 2030. Australia's emerging agriculture technology (agtech) industry will play an important role, and as a growing industry also has the potential to create high-skilled job and export market opportunities. The agriculture sector will also need to look at non-traditional opportunities and innovations emerging in other sectors – including fintech, regtech and other 'X-tech'.

Realising the opportunities presented by X-tech will require appropriate policy and regulatory settings that facilitate development of and investment in well-targeted innovations, and a systematic approach to address barriers to adoption. Further detail on these matters from an agriculture sector perspective is provided in the following pages.

Size and scope of the opportunity

Technology development and adoption will continue to be a key accelerator for agriculture sector growth, and will assist the sector to respond to future challenges and changing consumer demands. Digital technologies will be central to this. Economic analysis conducted as part of a 2017 collaborative research project (Precision to Decision) funded by the 15 Rural Research and Development Corporations found that unconstrained implementation of digital agriculture would result in a lift in the gross value of agricultural production (including forestry and fisheries) of \$20.3 billion¹. To put this opportunity in context, in 2019-20 the gross value of agricultural production is forecast to be \$59 billion.

There are already a vast range of applications for digital technology in agriculture, and this is growing quickly. Applications include water management and maintenance alerts, remote monitoring and management of livestock, crops and soil, precision chemical and fertilizer application, objective measurement and traceability. These applications assist farmers to make better decisions and to realise efficiencies – for example, by more efficiently managing stock, applying inputs, monitoring watering points and managing irrigation. They also assist with demonstrating – and improving – regulatory compliance. Increasingly these technologies will be used to ensure end-to-end product integrity and traceability by integrating supply chain data, which will be vital to ongoing market access. Future applications will further encompass data-driven technologies that employ automation and robotics, artificial intelligence (AI) and machine learning and satellite and remote sensing capabilities. Growth in uptake of agtech² – and indeed in the development of new agtech tools – is being enabled by increased access to broadband and data services in many areas. Despite improvements, lack of access to connectivity options also remains a barrier to uptake.

Sector change and technology development is increasingly driven by consumers, who are interested in where and how their food is grown, processed, packaged and transported, with concerns about animal welfare, environmental stewardship, chemical use and working conditions front and centre. Technological applications will better enable farmers and supply chain participants to efficiently collect and appropriately share the information demanded by customers and required to demonstrate their sustainability, food safety and food quality credentials. There are also opportunities to embrace new ways of bringing product to market and conducting business transactions for agricultural products. In all of these areas there is great opportunity for the agriculture sector to learn from, work with and utilise innovations emerging in other sectors (X-tech).

A relevant example is the emerging use of blockchain or distributed ledger technology, which has the potential to help address growing demands for supply chain transparency and traceability, and to help manage food safety, demonstrate product authenticity and improve the efficiency of commodity inventory and transaction management systems, particularly when combined with IoT technologies^{3,4}. Blockchain also presents the potential for farmers to connect directly with their end consumers, which in turn could bring additional profit margin back to the farm³.

¹ Perrett, E., Heath, R., Laurie, A. and Darragh, L. (2017). *Accelerating precision agriculture to decision agriculture – analysis of the economic benefit and strategies for delivery of digital agriculture in Australia*. Australian Farm Institute and Cotton Research and Development Corporation. Available at <https://www.crdc.com.au/precision-to-decision>

² Note that for the purpose of this submission and to align with the scope of the inquiry, the term ‘agtech’ refers only to digital or digitally-enabled technologies and does not include plant or livestock science.

³ AgriFutures Australia (2018). *Emerging agricultural technologies: consumer perceptions around emerging agtech*. Prepared by GHD and AgThentic. Publication No. 18/048, project No. PRJ-011141. www.agrifutures.com.au/product/emerging-technologies-in-agriculture-consumer-perceptions-around-emerging-agtech/

⁴ Deloitte (2018). *Blockchain: revolutionising the agriculture industry*. The Agribusiness Bulletin, Deloitte, October 2018. <https://www2.deloitte.com/au/en/pages/consumer-business/articles/blockchain-revolutionising-agriculture-industry.html>

Blockchain technology is already in use on a small scale or on a pilot basis in the sector – for example, as noted in the committee’s Issues Paper, Australian agricultural start-up AgriDigital uses blockchain to deliver its agri-commodity management platform, and is looking at further applications⁵. In a recent publication the Australian Farm Institute observed that while blockchain has potential to address a number of trust and traceability related issues in agri-food supply chains, the reality is that the technology ‘*is likely to create different opportunities and challenges for different industries, organisations and stakeholders depending on their current position in the market or in the value chain.*’⁶ Some of the specific barriers to the utilisation of blockchain in agriculture are detailed in the following section.

Blockchain is expected to become an increasingly important tool in global commerce and trade, delivering greater efficiency, transparency and security in transactions. The NFF supports the leading role Australia is playing in the development of common international technical and operating standards for blockchain. This important work will support privacy and security and could reduce costs by encouraging interoperability and market access, and will build trust and confidence in blockchain systems. It also positions Australia to take a leading role in realising the opportunities of blockchain technology.

Other data-driven and AI technologies and applications are also becoming increasingly important in agriculture, aiming to capture, combine and analyse data streams derived on and off farm to provide insights that farmers can act on to improve on-farm management decisions, business transactions and marketing of products. These applications draw on sensor data and data captured through other IoT devices, and satellite, meteorological and natural resource datasets as well as market data. Applications include precision farming – use of technologies and software to track yields, control equipment, monitor field conditions and manage inputs at very precise levels are already leading to substantial increases in productivity and profitability. With the roll out of data-intensive tech comes a number of associated issues around data infrastructure, data management and privacy, and there are opportunities for collaboration across X-tech industries to collectively address these matters.

There is significant interest in the opportunities that further technological development presents for Australia’s agriculture sector, and much activity underway to exploit those opportunities by growing the agtech industry⁷. Recent years have seen growth in the number of agtech related initiatives, funding opportunities and investment by both public and private sector stakeholders and agtech conferences and events. This is discussed further in the following sections.

Barriers to uptake

A 2018 study commissioned by AgriFutures Australia through its National Rural Issues Program examined the state of agtech adoption in Australia, barriers to farmers interacting with agtech and opportunities to drive technology adoption⁸. The study found:

⁵ For example CBH Group and AgriDigital, 2017. *Pilot report: solving for supply chain inefficiencies and risks with blockchain in agriculture*. November 2017. <https://www.agridigital.io/reports/blockchain-pilot-report>

⁶ Australian Farm Institute (2019). *Determining the value of blockchain for agriculture*. Farm Institute Insights Vol. 16, No. 1, February 2019. <http://www.farminstitute.org.au/news-and-events/newsletter-archive.html>

⁷ For example, van Delden, B. and Goddard, A. (2016). *Powering growth: realising the potential of agtech for Australia*. Startup AUS and KPMG, supported by the Queensland Government and Commonwealth Bank of Australia <https://home.kpmg/au/en/home/insights/2016/09/powering-growth-realising-potential-agtech-australia.html>

⁸ Nolet, S. and Mao, C. (2018). *Accelerating the development of agtech solutions worth adopting: challenges and opportunities for effective value proposition design in Australian agtech*. AgriFutures Australia Publication No. 18/045, Project No. PRJ-011295. www.agrifutures.com.au/product/accelerating-the-development-of-agtech-solutions-worth-adopting/

“The opportunities available in agtech are attracting new participants, such as entrepreneurs, with different skills, networks and areas of expertise. This new innovation pathway holds potential to help Australian agriculture increase in profitability. However, the rapid emergence of this new industry, and the pace at which it operates, has caused both confusion and frustration for existing industry players, including producers. Adoption of agtech is therefore low, and perhaps more critically, producers are becoming sceptical of the value that entrepreneurs and new technologies can bring to Australian agriculture.”

At a high level, key constraints or barriers to producer uptake of agtech include:

- Lack of access to telecommunications infrastructure and connectivity⁹. This remains an issue for many Australian farmers. The nature of the broadband connectivity options available (including coverage, speed, price, capacity and latency) is an important factor in technology uptake, and the poor quality of services in areas of regional Australia is a major factor restricting uptake.
- Producers perceive the value propositions of agtech products and services to be weak¹⁰. This issue is compounded by a lack of interoperability between products – i.e. farmers are unwilling to pay for a tool that isn’t compatible with the machinery / software / other tech that they already use or might purchase.
- Technologies are being pushed into the industry by entrepreneurs who do not understand the complexities of farming, rather than pulled into agriculture by producers who see value to be gained from adopting agtech solutions¹¹.
- Concerns about data privacy and ownership, and how farm data is used by agtech providers, undermines trust and can limit uptake.

In addition to these cross-cutting barriers, there are specific issues preventing uptake of individual technologies. For example, research has found that key limitations to the widespread uptake of commercial blockchain applications in agriculture include¹²:

- high energy requirements to fuel processing power
- availability of mechanisms, such as sensors and automated data capture, to capture error-free data – adoption may require an investment in additional, accurate data collection, and the returns on this investment are not yet assured
- the complexity of incentivising players all along the supply chain to use a blockchain-enabled system.

These matters are explored in some detail in the 2018 report *Emerging technologies in agriculture: Consumer perceptions around emerging agtech*, which also examines the barriers to adoption of a range of other technologies, including IoT, AI/big data, robotics, satellites and drones. This report was commissioned by AgriFutures Australia through the National Rural Issues Program, to build a better understanding of the substantial impact that consumer perceptions can have on the adoption of agricultural technology through the supply chain. The findings of this research have implications for X-tech more broadly, noting the importance of maintaining social licence in the context of technology adoption.

⁹ Perrett, E., Heath, R., Laurie, A. and Darragh, L. (2017). *Accelerating precision agriculture to decision agriculture – analysis of the economic benefit and strategies for delivery of digital agriculture in Australia*. Australian Farm Institute and Cotton Research and Development Corporation. Available at <https://www.crdc.com.au/precision-to-decision>

¹⁰ Nolet, S. and Mao, C. (2018). *Accelerating the development of agtech solutions worth adopting: challenges and opportunities for effective value proposition design in Australian agtech*. AgriFutures Australia Publication No. 18/045, Project No. PRJ-011295. www.agrifutures.com.au/product/accelerating-the-development-of-agtech-solutions-worth-adopting/

¹¹ Ibid.

¹² AgriFutures Australia (2018). *Emerging agricultural technologies: consumer perceptions around emerging agtech*. Prepared by GHD and AgThentic. Publication No. 18/048, project No. PRJ-011141. www.agrifutures.com.au/product/emerging-technologies-in-agriculture-consumer-perceptions-around-emerging-agtech/

As touched on in the previous section, the emergence of data-driven technology brings with it a number of issues related to data management and privacy. There is a significant and increasing amount of data collected on-farm and through the supply chain, and while the potential benefits and value of using this data are considerable, the tension between those who provide the data (farmers) and those who collect and have rights to the use of the data (agribusinesses and third parties) is a major hurdle to realising those benefits¹³. In a 2017 survey to inform the Precision to Decision project, more than 60 per cent of farmers said they had little to no trust in technology providers to maintain their privacy and not engage in unauthorised use of their data¹⁴. A further issue is a lack of visibility of where farm data goes, and in some cases producers not being able to gain access to data collected on their farms. Information on and access to farm data held by various organisations and individuals is important both in terms of stewardship and to capture the potential of the data resource. Many custodians of such data may not have the capacity to fully exploit the data, or be aware of its full potential.

Responding to recommendations made by the Precision to Decision project, the NFF is leading development of a voluntary Farm Data Code of Practice, to provide assurance to farmers around how their data will be used and that the value coming from that data will flow back to farmers. The Farm Data Code is part of a broader suite of initiatives to improve farm data governance and farm workforce digital capability being undertaken in response to the recommendations of the Precision to Decision project. Ten of the Rural Research and Development Corporations (RDCs) have recently invested in frameworks to guide and support digital innovation in Australian agriculture¹⁵, namely:

- An agricultural workforce digital capability framework.
- Agricultural data rules: best management practice.
- A digital maturity model and assessment tool for the agriculture industry.

Capitalising on these and other initiatives to build digital capability and support digital innovation in agriculture will require national leadership. A high level advisory group – bringing together cross-portfolio expertise – should be established to oversee the development of a digital strategy for agriculture, including a data strategy and data sharing policy.

Promoting a positive environment for X-tech startups

While the Australian agtech industry is still relatively immature on a global scale, there has been significant growth in activity in recent years. There are now at least eleven operational incubators, accelerator and pre-accelerator programs dedicated to food and agriculture across Australia, a growing number of public and private funding opportunities, and hundreds of agtech startups. Importantly, there has been a shift towards more customer-focused and farmer-led innovation.

Recognising the need for independent and reliable information to support producers to adopt agtech products, in mid-2019 the AgTech Finder digital platform was launched, providing information about hundreds of agtech products, with customer reviews, case studies and education resources. AgTech Finder¹⁶ is an initiative of the Food Agility CRC, and is supported by the NFF.

¹³ Sanderson, J., Wiseman, L. and Poncini, S. (2018). *What's behind the ag-data logo? An examination of voluntary agricultural data codes of practice*. International Journal of Rural Law and Policy, No. 1, 1-21.

¹⁴ Zhang, A., Baker, I., Jakku, E. and Llewellyn, R (2017). *Accelerating precision agriculture to decision agriculture: The needs and drivers for the present and future of digital agriculture in Australia. A cross-industry producers survey for the Rural R&D for Profit 'Precision to Decision' (P2D) project*. EP175936, CSIRO, Australia. <https://www.crdc.com.au/precision-to-decision>

¹⁵ <https://www.crdc.com.au/growing-digital-future>

¹⁶ <https://agtechfinder.com/>

Investment and funding

Access to funding and capital is critical to the success of X-tech startups, and governments have an important role to play in tax, regulatory and policy settings to facilitate and attract private equity and venture capital investment. This is a key mechanism by which governments can support Australia's farmers – and the broader economy – to realise the benefit of new and emerging technologies. For example, tax settings for venture capital and investors in innovation companies and the R&D Tax Incentive are important means by which the government can influence X-tech investment.

The committee's Issues Paper canvasses some of the issues faced by startups in Australia in accessing capital at various stages of business maturity. Agtech startups face similar issues to other X-tech startups in accessing capital, exacerbated by the relatively small size of the Australian agtech market, and by a lack of detailed investment sector understanding of the agtech and agriculture industry. A 2018 study led by the United States Studies Centre at the University of Sydney found that despite rapid growth, Australia's agtech investment market was small, at an early stage and not keeping pace with global peers¹⁷. The study found that higher value and later stage investments, which allow companies to scale, were at that time largely absent from the Australian agtech market. The final report made policy recommendations to harness the potential of Australia's agtech sector, which have broader relevance for investment in X-tech, and warrant consideration by the committee, namely:

- *Create incentives for sophisticated investors from overseas to open offices in Australia, particularly venture capital firms with domain experience in agtech. This would stimulate an increase in Series A and later-stage investment flow in the sector as well as transfer domain-specific expertise to the Australian investment community.*
- *Stimulate the establishment of technology-specific incubators and accelerators to create tight-knit, globally-connected investment communities around technology-specific expertise. This would allow AgTech companies in niche technology areas to access the right investors more easily and to develop confidence within the general investor community around these technology areas.*

There has been considerable momentum building in the agtech industry, and early stage agtech innovators now have access to numerous agtech-specific accelerator and incubator programs (e.g. Cicada GrowLab; SproutX; RocketSeeder; SparkLabs Cultiv8; AgFrontier), and a number of state government-funded initiatives including to support startups to test and scale products – such as the NSW Department of Primary Industries' collaborative research and technology 'GATE' facility¹⁸, and the South Australian Government's move to establish two new agtech demonstration farms. The provision of these services and programs should continue to evolve in line with sector requirements.

Late 2019 also saw the launch of Australia's first dedicated agrifood tech venture capital fund, Tenacious Ventures, which will invest up to \$30 million in high-growth early-stage companies improving the productivity, efficiency and sustainability of agricultural production. Tenacious Ventures is registered as an Early Stage Venture Capital Limited Partnership (ESVCLP), meaning investors are eligible for tax exemptions. The Australian Government undertook important reforms to the venture capital investment framework, including the ESVCLP regime as part of the 2016 National Innovation and Science Agenda, and consideration should be given to what further enhancements could be made in this area to support investment in Australian X-tech startups.

¹⁷ Maughan, S., et al. (2018). *Australian agtech: opportunities and challenges as seen from a US venture capital perspective*. October 2018, United States Studies Centre. www.ussc.edu.au/analysis/australian-agtech-opportunities-and-challenges-as-seen-from-a-us-venture-capital-perspective

¹⁸ The GATE: Global AgTech Ecosystem <https://www.thegate.org.au/>.

Creating an entrepreneurial and collaborative culture

Within the agriculture sector some recent initiatives have sought to improve commercialisation of the investment made in publicly-funded agriculture R&D, particularly through the Rural RDCs and CSIRO. At the same time there is a move towards building entrepreneurial thinking and skills, and attracting non-traditional R&D participants to solve challenges facing the agriculture sector, for example through the \$50 million GrainInnovate Fund and MLA Donor Company. AgriFutures Australia has taken a lead role in this movement and hosted the inaugural EvokeAG summit in Melbourne in February 2019, bringing together almost 1,200 delegates including local and international investors, entrepreneurs, researchers and farmers to showcase innovations, facilitate collaboration and investment and examine future opportunities for the industry. Building on the success of the inaugural event, a second EvokeAG summit will be held in Melbourne in February this year.

The RDCs have an important role to play in realising the agtech opportunity. In a recent submission to the *Modernising the Rural Research and Development Corporation System* discussion paper, the NFF highlighted the importance of enabling RDCs to leverage additional private sector and international investment to develop technologies and build capability. Some RDCs are already doing this, for example through the MLA Donor Fund and Horticulture Innovation's Frontiers Fund, but the NFF believes all RDCs should be enabled to create special investment vehicles for this purpose. The RDCs could also look at opportunities to build capacity in driving technology adoption – addressing the gap between researchers/tech developers and the practitioners in the field.

Building a culture that supports entrepreneurship and risk appetite – including in traditional research organisations – is also important, as is connecting entrepreneurial thinkers with technical specialists. With this in mind, consideration should be given to how to best facilitate and incentivise collaboration and the sharing of ideas and expertise across sectors – agtech requires people with skills that aren't traditionally connected to agriculture, including engineers, software designers, data specialists and business support services¹⁹.

Access to skills and talent

Access to a workforce equipped with the right skills and talent will underpin the growth of the X-tech sector in Australia. Achieving this requires an education and training system that equips Australians with the required skills, and immigration settings that allow access to global talent pools. Education determines the capability of workers and entrepreneurs, and therefore plays a key role in the economy's productivity and innovation capacity, and governments have a key role to play as funders and regulators of many aspects of the Australian education system. The NFF supports the recommendations made by Innovation and Science Australia in the November 2017 report *Australia 2030: Prosperity through innovation*²⁰ regarding education system reforms to build an innovation ready workforce in Australia.

It isn't always possible for the domestic market to meet demand for skilled workers, and Australia has a strong track record in skilled immigration. In recent years skilled migrants have been particularly important to startup companies in the technology sector. The NFF supports programs to facilitate access to global skills and talent through programs such as the Temporary Skills Shortage visa, the Global Talent Independent Program and the Global Talent Employer Sponsored schemes. There are opportunities to further refine

¹⁹ van Delden, B. and Goddard, A. (2016). *Powering growth: realising the potential of agtech for Australia*. Startup AUS and KPMG, supported by the Queensland Government and Commonwealth Bank of Australia <https://home.kpmg/au/en/home/insights/2016/09/powering-growth-realising-potential-agtech-australia.html>

²⁰ Innovation and Science Australia (2017). *Australia 2030: Prosperity through innovation*, Australian Government Canberra. <https://www.industry.gov.au/data-and-publications/australia-2030-prosperity-through-innovation>

immigration rules and programs to improve access to specialist skilled talent, and attract entrepreneurs from overseas²¹.

Building on existing reform efforts

Many of the issues touched on in this submission were examined in detail in the November 2017 report *Australia 2030: Prosperity through innovation*, and the NFF supports the ongoing implementation of the report's recommendations, made across five policy areas²²:

- Education: respond to the changing nature of work by equipping all Australians with skills relevant to 2030.
- Industry: ensure Australia's ongoing prosperity by stimulating high-growth firms and raising productivity.
- Government: become a catalyst for innovation and be recognised as a global leader in innovative service delivery.
- Research and development: improve R&D effectiveness by increasing translation and commercialisation of research.
- Culture and ambition: enhance the national culture of innovation by launching ambitious National Missions.

Recommendations

The National Farmers' Federation asks that the Committee consider the following recommendations for the Australian Government to support Australian farmers and agriculture sector participants to realise the opportunities of X-tech:

1. Continued investment and policy reform to improve telecommunications infrastructure and coverage in regional Australia, to enable farmers to adopt X-tech into their production systems.
2. That the Australian Government adopt a leadership role in digital agriculture by establishing a high level advisory group to oversee development of a digital strategy for agriculture, including a data strategy and data sharing policy.
3. Continued implementation of the recommendations made in the *Australia 2030: Prosperity through innovation* report.
4. Further enhancements to the venture capital investment framework and incentives for early stage investors, to ensure international competitiveness and support growth in investment in Australian startups.
5. Ensure the R&D Tax Incentive settings are optimised to incentivise investment in innovation by agribusiness and X-tech startups.
6. Rural Research and Development Corporations should be encouraged to leverage private sector and international investment and improve outcomes for farmers by being enabled to create special investment vehicles.

Thank you for the opportunity to provide a submission to this inquiry. Should you require any further information, please contact Adrienne Ryan, General Manager Rural Affairs, on 02 6269 5666 or aryan@nff.org.au.

Yours sincerely,

PRUDENCE GORDON

A/g Chief Executive Officer

²¹ Ibid.

²² Innovation and Science Australia (2017). *Australia 2030: Prosperity through innovation*, Australian Government Canberra. <https://www.industry.gov.au/data-and-publications/australia-2030-prosperity-through-innovation>