

Queensland AgTech Roadmap

2023–2028





The Department of Agriculture and Fisheries proudly acknowledges all First Nations peoples (Aboriginal peoples and Torres Strait Islanders) and the Traditional Owners and Custodians of the country on which we live and work.

We acknowledge their continuing connection to land, waters and culture and commit to ongoing reconciliation. We pay our respect to their Elders past, present and emerging.

Queensland AgTech Roadmap 2023–2028

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Minister's foreword



Everyone in Queensland is connected to food and agriculture. The sector is vital to Queensland's prosperity and underpins our rural communities by supporting regional economic development and jobs, community health and wellbeing, and the environment.

While the production of food, fibre and foliage is one of the oldest industries, it has never stood still. Queensland's producers live and work in an uncompromising environment. To survive and thrive, producers have needed to adapt and innovate, overcoming droughts, floods, bushfires and other extreme weather events. As our climate changes, these events will become more commonplace.

Producers have been responding to changing customer requirements and expectations by becoming more innovative in the way we grow, produce, harvest, distribute and consume food, fibre, foliage and, increasingly, bioproducts for biofuel and other uses. Agribusinesses are looking for innovative solutions so they can thrive in these changing times.

Queensland has a global reputation for high-quality, safe and trusted agricultural products. We are home to many entrepreneurs and innovators creating, developing and maintaining technology used across the agricultural sector. These businesses are delivering innovative products and services that are transforming the landscape of Queensland agriculture. Queensland-made and serviced AgTech innovations are highly sought after by agribusinesses seeking out service providers that understand their business and local needs.

Queensland's agriculture sector is embracing and capitalising on emerging technologies and tools, driving digital transformation across supply chains. Access to high-quality digital networks will enable a more individualised, integrated and efficient digital economy that can use data-driven systems to tackle challenges and unlock opportunities.

AgTech is critical for enabling a sustainable and trusted sector that can deliver enhanced environmental, social and governance outcomes. Traceability and verification systems will ensure our industries and their products remain not only competitive, but suppliers of choice for increasingly discerning global markets. We want our growers and producers to be global leaders—early adopters of revolutionary technology, and the first to bring new products and services forward to export to the world.

The *Queensland AgTech Roadmap 2023–2028*, supports and drives the digital transformation of the agricultural sector. This is our plan for AgTech in Queensland. The roadmap is for everyone, not only agribusinesses and innovators, but those who benefit from the business investment that follows.

We have a strategic opportunity to build on the transformational investments in Queensland across areas like clean energy, space, natural capital, biotechnology, health and the digital economy.

Together, let's make Queensland the natural home of AgTech for sustainable agriculture.

Honourable Mark Furner MP

Minister for Agricultural Industry Development and Fisheries and Minister for Rural Communities

About the roadmap

The *Queensland AgTech Roadmap 2023–2028* sets our vision and path to accelerate AgTech innovation and adoption in Queensland. By strengthening collaboration across the AgTech ecosystem and adopting, adapting and advancing technological innovations, Queensland will become a destination for the development and export of world-leading AgTech.

AgTech is any innovation used across the agribusiness and associated value chains (the agri-system) to improve efficiency, profitability, sustainability and credibility. It includes hardware and software, business models, new technologies and new applications.

Responding to the COVID-19 pandemic, along with other disruptors, demonstrated more could be done digitally, and agribusinesses across the value chain are being driven to investigate alternative solutions to long-term problems like labour shortages.

Integrated AgTech solutions will transform global agriculture, creating an opportunity for efficiencies, and will:

- drive productivity and sustainability
- strengthen traceability and provenance
- allow agribusinesses to verify their environmental, social and governance (ESG) impact
- support biosecurity preparedness and response
- build climate resilience and quantify emissions reduction.

The roadmap brings together the Queensland AgTech innovation ecosystem to collaborate and focus action in areas of greatest impact. It seeks to achieve our vision and support a globally connected digital agri-system.

The roadmap sets out a framework for strategic actions identified across five focus areas, seeking to harness

Queensland's strengths. The roadmap and associated actions will evolve to remain responsive to the needs of stakeholders, consumer expectations and the global marketplace.

While developing the roadmap, we heard from stakeholders that clarity is needed on what is included in AgTech, noting that technological innovations can be applied to many areas of an agri-system. Throughout engagement, we have co-designed strategic actions that will collaboratively pave the way forward. We have discovered and recognised enormous diversity in talent and expertise across the AgTech innovation ecosystem in Queensland. Some of those success stories are included in this roadmap.

Much like an agribusiness's journey to adoption, the roadmap is dynamic and is designed to respond to innovation advancements and user needs over time.

Our engagement

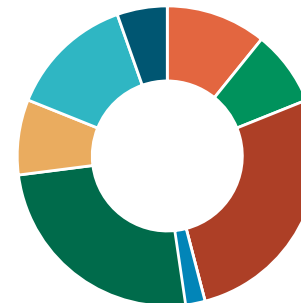
The draft roadmap was developed with:

Over **1,000** Participants in engagement activities

Over **500** Individual insights

Since the public release of the draft roadmap, over **120** stakeholder submissions have been received from:

- AgTech users
- Government
- Agricultural associations, communities or hubs
- Investors
- Innovators and AgTech developers
- Educators
- Research organisations
- Agribusiness professionals



Top 3

Recommendations for improvement

- Demonstrate return on investment
- Increase understanding of AgTech
- Enhance infrastructure to enable AgTech

AgTech Advisory Group

and Queensland Intergovernmental Steering Committee development and implementation

Our vision

Queensland's sustainable agri-system is a global centre for AgTech.

To achieve this, we will need to:

- **Adopt**—increase agribusinesses' capability and adoption of AgTech.
- **Adapt**—increase commercial-ready technology that addresses key agribusiness challenges.
- **Advance**—enable technology transformation that benefits Queensland's economic, social and environmental future.

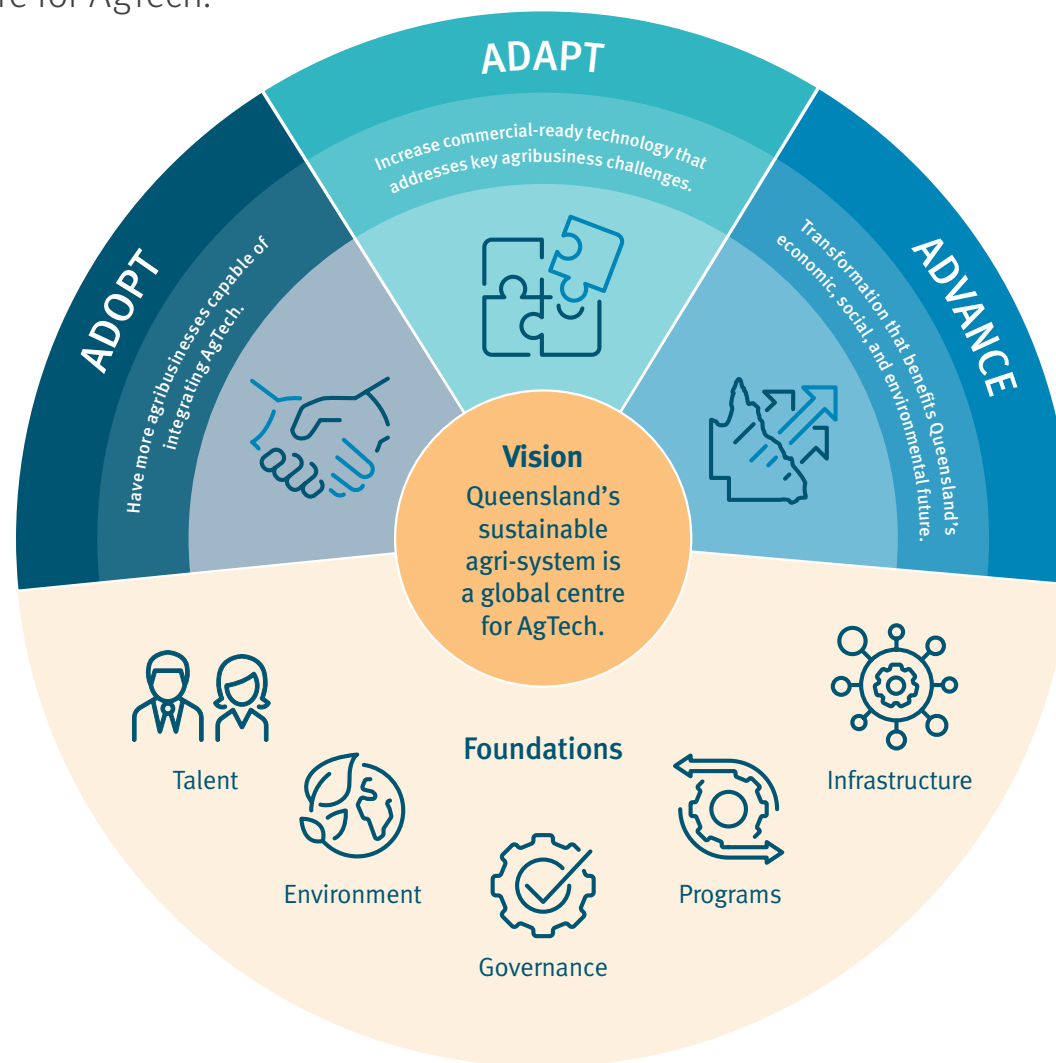
Working collaboratively, we will achieve our vision by focusing efforts on these five areas:

- **Strengthen** the innovation ecosystem.
- **Activate** innovation infrastructure.
- **Attract** and build local capability.
- **Connect** to domestic and global opportunities.
- **Coordinate** for action.

Achieving our vision is underpinned by Queensland's established strengths in our:

- talented people in industry, academia, private enterprise and government
- diverse climate and ecosystems that provides an excellent sandpit for testing and broad industry applications
- trusted governance arrangements across the value chain
- targeted programs for key government and industry priorities
- cutting-edge, decentralised common user infrastructure.

This framework was developed with comprehensive stakeholder input and analysis and will inform future actions.

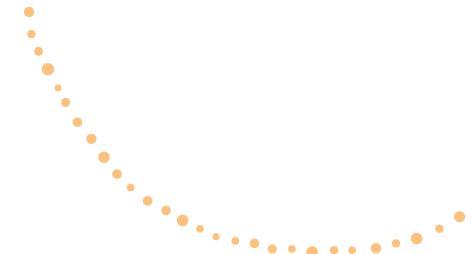


Queensland: a leader in AgTech

Queensland is recognised as a leader in agricultural production and innovation. Supported by economic and social infrastructure, Queensland is positioned to also become a preferred destination for world-leading AgTech development and adoption.

Our diverse landscapes and regionalised footprint provide an advantage for the state to capitalise on the rapidly growing global AgTech market value—set to triple to \$45.4 billion by 2026.¹ Queensland is seeking trusted partners to invest in our AgTech ecosystem, pursue advancements in technologies and develop solutions to global challenges.





Strong agriculture

The Queensland agribusiness and food sector has a key role in providing safe, sustainable food and other commodities to an increasing world population. Queensland has the highest proportion of land area in Australia managed for agriculture at more than 80%, compared to other Australian states and territories.²

Queensland's primary industry commodities were estimated to be \$24.44 billion in 2022–23, and account for approximately 12% of Queensland's overseas exports. The industry employs more than 363,000 people across the agribusiness supply chain.³ This provides opportunities across a range of industries to adopt, adapt and advance digital innovations.

An active innovation ecosystem

Queensland has a diverse and connected innovation ecosystem spanning remote, regional and urban settings. Our established AgTech hubs, business clusters and networks provide a place to connect and collaborate. Through our AgTech programs and services, including start-up accelerators and Advance Queensland initiatives, the ecosystem is well placed to respond to challenges facing the agri-system and unlock its full innovation potential to lift productivity and profitability growth, reduce emissions, increase resilience and enhance natural capital. With strengths in research, development, commercialisation and extension, we are keen to explore partnership opportunities to position Queensland as a global centre for AgTech.

The \$76 million *Queensland Quantum and Advanced Technologies Strategy* builds on a range of key strengths that have been developed over more than 30 years of quantum-related science in the state. Queensland's quantum science base is both broad and deep, with world-class quantum theory and experiments. The strategy sets out the state's plan to strengthen and build on our capabilities in quantum and related 'deep' technologies to drive high-value job creation, scaled-up advanced manufacturing and investment in promising home-grown start-up companies. It will also advance the take-up of transformative solutions across our emerging and traditional industries including AgTech to transform farming practices from sustainable crops to livestock health.

Queensland Smart Farms offer innovators, researchers and AgTech developers the ability to test and showcase the real benefits of technology. Smart Farms work with agribusinesses to discover how technology can benefit their business, helping them make informed decisions on which AgTech they should adopt. Smart Farms can also provide a regulatory testing environment for AgTech, supporting government in providing the enabling conditions for further development and adoption of new technology in Queensland.

1 BIS Research, 2022 (values converted from USD to AUD on average 2021 F11 exchange rate data sourced from Reserve Bank of Australia).

2 Based on Australian Bureau of Statistics International Merchandise Trade data 2021–22p, available at Agricultural exports, Department of Agriculture and Fisheries, Queensland (daf.qld.gov.au).

3 Queensland Department of Agriculture and Fisheries, Data Farm, 2023.



Queensland's agricultural industries and tech sector are creating new innovations and adopting technologies to improve efficiency, advance environmental practices and increase product quality.

Queensland's agricultural products and regional industries remain the best in the world, and their innovations are launching AgTech founders onto the global stage.⁴

Diverse climatic environments

Queensland has tropical and subtropical regions and a small temperate area, creating a testing bed for innovators to trial their technology in a range of geographical locations and climatic conditions. Agribusiness hubs such as Toowoomba are strategically placed in proximity to these diverse climatic regions and industries, and alongside enabling infrastructure, providing unparalleled opportunities.

Talented people and services

Queensland has proven to be Australia's employment powerhouse, leading the nation in job creation with continued economic growth in recent years and a forecast 7.6% increase in employment by 2025–26.⁵

The *Good people. Good jobs. Queensland Workforce Strategy 2022–2032* is the Queensland Government's 10-year plan for a strong, skilled and diverse workforce ready to seize today's jobs and adapt to future opportunities, including through the evolution of the AgTech innovation ecosystem. The strategy's first Action Plan includes \$70 million in new initiatives supporting businesses to address workforce challenges and supporting more people into jobs through training and skills development.

Queensland has some of the best educational institutions in the world offering agricultural qualifications to support development of an AgTech workforce. The University of Queensland is ranked the best university for agriculture in Australia and fourth globally, with UQ Skills offering Agricultural Digital Technologies as a short course. UniSQ offers a dedicated degree in AgTech and management, working alongside international agribusiness and researchers. TAFE Queensland provides a wide range of nationally recognised vocational qualifications supporting

employment across many agri-system jobs through contemporary state-owned training add infrastructure, complemented by private service providers. Centres of Excellence and other facilities for rural, agriculture and aquaculture industries at Toowoomba, Bundaberg, Bowen and Cannonvale total \$16.85 million of investment.

Queensland has a strong and diverse workforce ready to adapt to the many future opportunities created through an evolving AgTech innovation ecosystem.

Established global networks

Queensland has high-quality, tried and tested tech solutions, products and services on offer. An abundance of diverse and unique partnerships and investment opportunities are available in AgTech, positioning Queensland as an investor destination of choice. Queensland's primary industries export to over 130 destinations worldwide, allowing agribusinesses a wide reach into the global marketplace.⁶

Environmental, social and governance credentials

The Brisbane 2032 Olympic and Paralympic Games sustainability commitments provide an unparalleled opportunity to showcase our circular economy and supply chains, high-quality food and fibre, and AgTech expertise, while strengthening trade and investment relationships.

Queensland's agriculture and land use sectors continue to find innovative ways to reduce carbon emissions. The Queensland Government is committed to achieving a zero net emissions economy by 2050. The *Queensland Low Emissions Agriculture Roadmap 2022–2032* provides a framework to achieve a low emissions agriculture sector. The Queensland Government will support the sector to understand and report on the impact of new AgTech and practice change on Queensland emissions to 2030 and 2050.

The agri-system also has the ability to leverage ESG experience and connections with Queensland's world-class mining equipment, technology and services (METS) and resources sectors. These critical regional industries can transform, together.

Stable, trusted and supportive government

The Queensland Government is committed to fostering a resilient and competitive economy through diverse business opportunities and global relationships. Queensland has a stable and responsive government that is committed to service delivery within the regions.

The government's *Buy Queensland 2023* procurement approach has a firm focus on supporting quality, local jobs, boosting the Queensland economy, and leaving a legacy for current and future generations of Queenslanders. It can contribute to the development of AgTech industries in Queensland, drive sustainable economic growth, encourage innovation and increase supplier diversity. This includes opportunities associated with the Brisbane 2032 Olympic and Paralympic Games, and consistent with Queensland's ESG credentials and aspirations.


Strong relationships between government and industry position the ecosystem to respond to current and emerging challenges and opportunities. Queensland has invested in people and infrastructure to support a vibrant and growing ecosystem now and into the future.

4 Queensland's Chief Entrepreneur, Julia Spicer OAM, 2023.

5 Jobs Queensland. Anticipating Future Skills series, August 2023.

6 TIQ. Innovative Technology, 2023.





Drivers and opportunities

Looking to the future, global agriculture faces an increasingly dynamic and complex operating landscape. There are several key global drivers effecting change in the agri-system that are creating opportunities for the adoption of AgTech innovation. The AgTech innovation ecosystem is well-placed to provide the skills, solutions, products and processes to tackle future challenges and respond to opportunities.



With an outlook to 2042, CSIRO has released the *Our Future World* report, which explores the geopolitical, economic, social, technological and environmental forces unfolding around the world. These forces will impact Australia's people, businesses and governments. Adapting to climate change, reducing emissions, land use challenges, addressing biodiversity decline, health risks, geopolitical shifts, digitisation, automation and consumer demands will drive global change over the next 20 years.⁷

AgTech will be an intrinsic part of the future of agriculture, solving problems and growing businesses. The 2023 McKinsey Technology Trends Outlook has identified several key technologies that can assist businesses to lift productivity and profitability. Future opportunities exist in applied artificial intelligence, bioengineering, advanced connectivity, clean energy, machine learning, immersive reality, as well as digital identity for provenance and cybersecurity.⁸

Global consumer expectations

From consumers and markets, to boardrooms and investors, the world is seeking quality food and fibre that is safe and sustainable. Value is placed on products grown in a climate-smart, and nature positive, way that also consider social outcomes including those for regional, rural and remote communities, and First Nations peoples. Consumers want to know where their products come from and how they are produced, and importantly, they want value for money. AgTech solutions enable producers to differentiate themselves in global markets and demonstrate their

environmental and social credentials by providing value chain transparency, while also keeping costs down or creating new value for consumers.

Importantly, this will not only enable the accurate and timely disclosure and transparency of ESG credentials, it also combats food fraud. This includes enabling First Nations peoples to protect, report and capitalise on Indigenous Cultural and Intellectual Property, provenance and ownership.

Food security

Global demand for food production is projected to increase by more than 50% by 2050.⁹ The accelerated adoption of AgTech along the value chain will strengthen food security in Queensland, our region and the world.

AgTech is transforming agri-systems to enhance availability (productivity), accessibility (efficient supply chains) and food safety, while increasing resilience to biosecurity threats and climate change.

AgTech is essential to enable a simultaneous uplift in production intensity and yields (e.g. protected cropping), while reducing emissions and overall environmental footprint (e.g. precision fertiliser application). This technology-driven transformation will be essential to supporting regional economies and rural communities that are largely underpinned by the agri-system.

Reducing the global footprint

Technological solutions can be applied across the value chain to minimise environmental impacts from agriculture. Opportunities exist to develop novel products, processes and industries, creating future foods, new energy sources and nutraceuticals that together will transform and enhance the value of the sector, while strengthening the environmental and social credentials of global agriculture.

7 CSIRO, *Our Future World: Global megatrends impacting the way we live over coming decades*, 2022.

8 McKinsey Technology Trends Outlook, 2023.

9 World Resources Institute, *World Resources Report: Creating a Sustainable Food Future*, 2019.

The Queensland Government is committed to addressing biodiversity loss and protecting and restoring biodiversity values, including through improved circularity and waste reduction, soil and water management, the optimisation of chemical use, as well as through addressing our contribution to climate change, building climate resilience, managing invasive species, and increasing resource and land-use sustainability.

Decarbonisation of all industries is a global imperative. Queensland has a target of a 30% reduction in emissions below 2005 levels by 2030, and zero net emissions by 2050. The Queensland Government is also committed to powering Queensland with 50% renewable energy by 2030, 70% by 2032, and 80% by 2035. Electrification of equipment and vehicles will play a role in decarbonisation. AgTech companies will benefit from innovations in niche battery solutions among other drivers identified through the development of the Queensland Battery Industry Strategy.

The *Queensland Low Emissions Agriculture Roadmap 2022–2032* recognises technologies will be critical in achieving a low emissions agriculture sector. The Brisbane 2032 Olympic and Paralympic Games to be hosted in Queensland has also committed to be climate positive. Suppliers seeking Brisbane 2032 opportunities will need to be prepared to demonstrate their sustainability and climate credentials.

Consumers and markets, locally and overseas, increasingly demand assurances for improvements in environmental sustainability. This includes increasing soil health, reduced pesticide and fertiliser use, and a move to biological solutions, improved animal welfare and reductions in

food waste. AgTech will continue to play an important role in enhancing environmental performance, including land management practices to protect our natural assets such as the Great Barrier Reef.

Jobs and skills

AgTech provides an opportunity to create new jobs in the agri-system, attracting people with different skills and backgrounds into the industry. Many of Queensland's regional communities are based around agriculture and its associated value chains. The AgTech ecosystem provides opportunities for a strong and diverse regional workforce through the attraction and development of new, specialised skills and capability that the industry needs now and into the future.

Building and diversifying the skills of existing agribusiness employees will help them to adopt AgTech, integrate it with existing systems, and most importantly, build capability to use data-driven approaches in business operations and decisions. AgTech solutions also enable a more inclusive agricultural workforce, supporting people with all abilities to participate in the value chain.

Healthier and happier people

From a consumer perspective, increasingly advanced technology such as hand-held near-infrared spectroscopy devices that can analyse nutritional content, alongside verification systems, will empower data-driven and informed choices like never before.

AgTech also gives farmers the ability to engage in the agri-system remotely and make real-time decisions to create efficiencies on-farm and throughout the production system. These efficiencies can support the health and wellbeing of producers by reducing exposure to workplace health and safety risks, improving access to information and management decisions, while enabling them to focus on other critical areas of their business and personal life.

Greater connectivity through digital innovation and infrastructure enables rural and remote communities to connect, share, collaborate and innovate.

Cybersecurity and trusted data

The adoption of new and enhanced technologies brings with it new challenges. The *Australian Cyber Security Centre Threat Report* noted that 67,500 cybercrime reports were made in 2020–21. Medium-sized businesses, with between 20 and 199 employees, reported the highest average financial loss due to cybercrime.

Increasing people's digital trust and literacy will support the use and integration of technology into businesses, allowing them to optimise the use of data, manage their data and cyber risks, and embrace data-driven solutions.

The application of data analytics in agriculture can transform supply chain management, create efficiencies in regulatory compliance, assist to identify and anticipate biosecurity risks, and enhance traceability.

The presence of a trusted data ecosystem where key data can be accessed, used and shared will ensure information is readily available, unlocking the value of AgTech.

Investment

We all have a responsibility as stewards of Queensland's abundant natural, human and capital resources for future generations. Increasing global expectations require the state to demonstrate its approach to considering ESG risk factors and sustainability issues in its decision-making.

Investments and advancements across Queensland's agri-system and in AgTech adoption and development are attracting global interest. Global capital will continue to be essential to securing a future of sustainable, inclusive growth.

Interest in AgTech globally is booming and Queensland is looking to attract new investments. The *2022 AgFunder AgriFoodTech Investment Report* shows a surge in venture capital investment in the AgTech sector, with \$68.9 billion recorded in 2021, an increase of 85% over 2020.¹⁰ In Australia, an estimated \$115 million was invested into AgTech start-ups in 2021 across 14 venture deals.¹¹

The emergence of new AgTech venture capital funds, private investment and recent AgTech-focused funding from the Rural Research and Development Corporations reflects a maturing capability of the Australian AgTech sector.



¹⁰ 2022 AgFunder AgriFoodTech Investment Report (values converted from USD to AUD based on average 2021 F11 exchange rate data sourced from the Reserve Bank of Australia).

¹¹ BDO analysis and reference materials from CB Insights during the compilation of the draft AgTech Roadmap, 2022.

Building on strategic directions

The roadmap is complemented by a range of other strategies, roadmaps, plans and initiatives that enable the agri-system.





Queensland

- *Queensland Economic Strategy*
- *Queensland Quantum and Advanced Technologies Strategy*
- *Climate Positive Brisbane 2032 Olympic and Paralympic Games*
- *Queensland Climate Action Plan and Queensland Climate Adaptation Strategy 2017–2030*
- *Queensland Low Emissions Agriculture Roadmap 2022–2032*
- *State Infrastructure Strategy 2022–2042*
- *Queensland Trade and Investment Strategy 2022–2032*
- *Innovation for a Future Economy 2022–2032 Roadmap*
- *A Place to Innovate – Queensland Innovation Precincts and Places Strategy*
- *Deadly Innovation Strategy*
- *Digital Professional Workforce Action Plan 2020–2024*
- *Queensland Agriculture Industry Workforce Plan 2022–2027*
- *Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan*
- *Queensland Biofutures 10-year Roadmap and Action Plan*
- *Queensland Energy and Jobs Plan*
- *Good people. Good jobs: Queensland Workforce Strategy 2022–2032*
- *Our Thriving Digital Future: Queensland's Digital Economy Strategy*
- *North West Queensland Economic Diversification Strategy Implementation Plan to 2025*
- *Buy Queensland 2023 and Q2032 Procurement Strategy*
- *Conserving Nature – a Biodiversity Conservation Strategy for Queensland*

National

- *Digital Foundations for Agriculture Strategy*
- *National Agricultural Traceability Strategy*
- *2030 Roadmap – Australian Agriculture's Plan for a \$100 Billion Industry*
- *Australian Farm Data Code*
- *Australia: A Global Hub for Agriculture 4.0*
- *Australian Agricultural Sustainability Framework*
- *National Biosecurity Strategy*
- *National Aquaculture Strategy*
- *Data Strategy 2021–2024*
- *Reef 2050 Long-Term Sustainability Plan*
- *Australia's Cybersecurity Strategy 2020*
- *CSIRO Reshaping Australian Food Systems 2023*
- *CSIRO Food and Agribusiness Roadmap*

Global

- *United Nations Sustainable Development Goals*

Building connections in the innovation ecosystem

It takes an ecosystem to scale an innovation.

The AgTech innovation ecosystem includes all the organisations, individuals and communities involved in the development and adoption of AgTech. Each person in the innovation ecosystem plays a crucial role in supporting, connecting, educating and translating technologies into applications to address current and future challenges.

Technology is evolving rapidly, and this change will only accelerate. In comparison, the rate that an organisation or business adopts new practices can sometimes be slower depending on previous investments and existing structures and culture. Innovation ecosystems have grown in importance to accelerate the development and adoption of technology by breaking down existing barriers, challenging old frameworks and processes, and delivering value to consumers.

The process of developing, testing and scaling innovation requires support and investment from a broad range of stakeholders across the agri-system. New 'left field' players, including those from other sectors, help inspire and challenge the agricultural sector and related value chains, leading to new ways of thinking and operating.

Queensland has a well-established innovation ecosystem, some of which is focusing on challenges and opportunities across agriculture, food and the bioeconomy more broadly. Interactions and investments

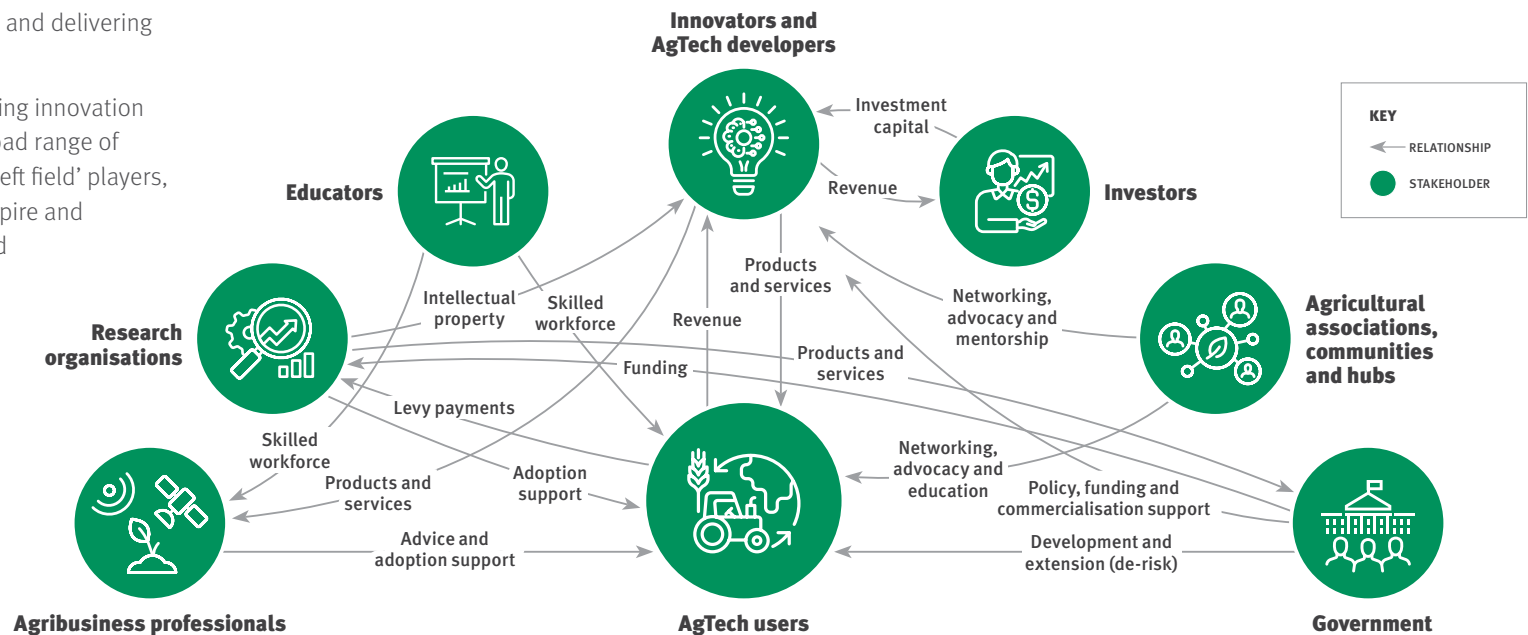
between organisations, individuals and communities involved in the development and adoption of AgTech are evident within and outside the agri-system. The agriculture sector is well placed to leverage technology solutions being developed in Queensland for other sectors such as defence, METS, aeronautical science, space, energy and health.

Queensland has a strong foundation of research, development, extension and innovation. Significant Queensland Government investment has been made through Advance Queensland initiatives, the Department of Agriculture and Fisheries and the Queensland Chief

Entrepreneur to facilitate greater innovation that supports sustainable economic development.

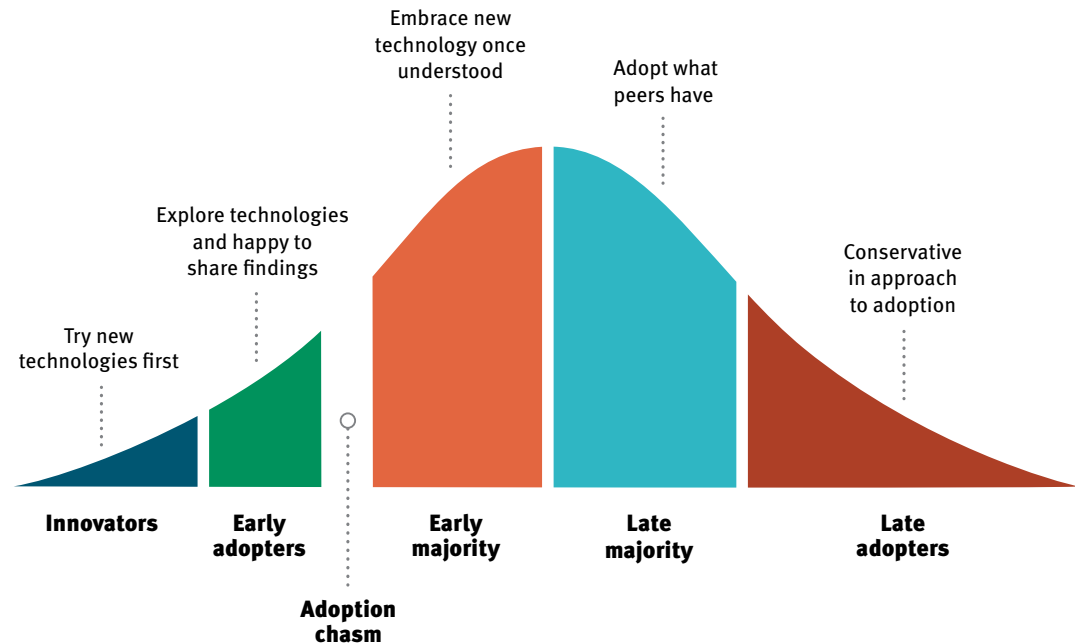
Queensland is continuing to draw talent and investment into our AgTech innovation ecosystem. This investment includes the development of Queensland Smart Farms (facilities that trial and validate technology and techniques), dedicated innovation hubs, and a range of Advance Queensland programs that support entrepreneurial activity and commercialisation, with increasing focus on the regions.

Connect with the AgTech community here daf.qld.gov.au/agtech.



Where are **YOU** on your AgTech journey?

Working collaboratively, we can support each other to jump the chasm and adopt emerging AgTech solutions across the agri-system.



Through a connected and responsive AgTech innovation ecosystem, the journey to adoption can be impactful for both developers and users of AgTech.

It is understood everybody is at a different stage and looking for different solutions. The reasons for the development and adoption of AgTech and new practices are highly specific to the individual, business and the broader operating environment.

People adopt AgTech at varying rates depending on risk appetite, access to resources and the outcome they want to achieve.

The adoption curve illustrates the difference between the speed which people adopt.¹²

Innovators and early adopters are actively seeking and creating the tools they need to solve a business problem.

The **early and late majority** need to see more evidence, learning from those that were first to adopt.

Those **late to adopt** often require different types of support due to capacity, capability and other factors.

By helping more AgTech developers and users to embrace a mindset that is open to change, learning and growth, Queensland's agri-system will be prosperous and resilient.

Early adopters may also benefit from an early-to-market advantage and capturing value before our competitors. AgTech developers will benefit from this mindset by adapting and refining technologies that the majority of agribusinesses can see value in adopting.

With targeted activities and collaborative action through implementation of the roadmap, there is an opportunity to accelerate the adoption of innovation across Queensland's agri-system. The roadmap actions support innovation and adoption by walking with businesses to help de-risk decision-making, and sharing knowledge across the AgTech ecosystem.

¹² Technology adoption curve adapted from Everett Rogers *Diffusion of Innovations* (1962).

N-Drip innovation for broadacre farming in Australia

N-Drip Australia is revolutionising irrigation for the broadacre farming sector by offering a sustainable alternative to flood irrigation and for dryland crops, especially in regions where the capital costs associated with traditional pressurised irrigation systems are prohibitive.

N-Drip's standout feature is the way it uses the power of gravity, combined with a novel micro-irrigation technique, giving it great versatility. Compatible with any laser-levelled field, the system opens doors for a wide range of growers keen to transform their fields. By doing so, they can boost their farm's productivity, increase yields, maintain soil health and ensure their land remains a valuable asset.

Committed to pushing the boundaries of precision and efficiency, the company also introduced N-Drip Connect™, a state-of-the-art decision support system. Monitoring plant health while simultaneously delivering continuous irrigation and nitrogen recommendations, this system enables farmers to optimise water and nitrogen use, increase crop yields and guarantee the overall vitality of their plants.

The Rother family from Nangwee tested the N-Drip system on their cotton crops. The results? A staggering 26% water saving, and 47% higher yield compared to their traditional flood-irrigated yields. Howard Rother's testimonial speaks volumes: 'The drip field yielded 11 bales to the hectare compared to the flood's 7.5—an outstanding outcome. The system not only justified its cost in one year, but the water savings also enable us to introduce an additional crop rotation.'

Howard has already converted about 50% of his farm to N-Drip irrigation and plans on converting the rest of his cotton blocks in the near future.

Udi David Stern, N-Drip Australia General Manager, says, 'We started with a single office in Cairns, and have since expanded to Toowoomba, including a leased warehouse. We've grown from a single employee in the first year to a team of 13 today, with eight based in Queensland.'

'Initially, our block sizes averaged between two and five hectares. This increased to 38 hectares last year. Impressively, our sales have tripled year-on-year for the past three years and are projected to double this financial year,' says Udi.

'Queensland's innovation ecosystem has been incredibly supportive of our endeavours. The AgTech and Logistics Hub in Toowoomba, for instance, provided a nurturing environment for over 18 months before we established our own base. The strategic location near Brisbane's port and proximity to the Darling Downs farming community have also been advantageous,' says Gary Campbell, N-Drip Australia Operations Manager.

With the escalating demand for water-efficient agricultural methods, N-Drip could redefine the future of cotton farming in drought-prone areas, delivering benefits to both farmers and the environment.



Roadmap focus areas

To meet the Queensland AgTech Roadmap vision, government and industry need to work together to deliver actions under five focus areas.



Strengthen the innovation ecosystem

A connected and collaborative innovation ecosystem that advances AgTech in Queensland



Activate innovation infrastructure

Innovation infrastructure that supports the adaptation, adoption and export of AgTech



Attract and build local capability

AgTech capability and digital literacy within the Queensland agriculture sector is increased and supported by a talent pipeline



Connect to domestic and global opportunities

Queensland is recognised as a global leader in AgTech, and a partner of choice in sustainable production and processing of food, fibre, foliage and other bioproducts



Coordinate for action

An active Queensland AgTech innovation ecosystem underpinned by a coordinated approach to policy and programs

Strengthen the innovation ecosystem



Outcome

A connected and collaborative innovation ecosystem that advances AgTech in Queensland

Innovation ecosystems are coordinated by individuals or small groups, and play to the strengths of their individual regions or interests. These ecosystems occur where innovation and entrepreneurship are highly concentrated for economic growth.

Multiple AgTech innovation ecosystems are emerging across Queensland, at varying levels of maturity, which are attracting global interest. By strengthening and connecting these innovation ecosystems, Queensland will continue to create an environment where AgTech is being adopted and adapted to advance the global agri-system. These networks, clusters and hubs of people and places are tackling shared challenges and opportunities to increase rural and regional resilience, productivity and profitability. Climate change, and the need to advance climate adaptation and emission reduction, is one of the largest drivers of AgTech innovations.

The Queensland AgTech innovation ecosystem will

Grow and sustain regional innovation ecosystem builders who support local businesses to scale up and commercialise innovative products, technologies and services through targeted programs

Enable extension, adoption and business support activities that increase confidence and trust in AgTech, and help agribusinesses to integrate solutions that ultimately increase resilience through sustainable growth in productivity and profitability

Establish a statewide AgTech network to share experiences and learnings and collaborate on challenges and opportunities

Boost engagement and communication activities across the innovation ecosystem to enhance awareness of programs and initiatives

Create a pathway to enhance First Nations peoples' participation in the innovation ecosystem, particularly in the development and adoption of traceability and verification systems that protect and grow Indigenous Cultural and Intellectual Property

Promote and share information about Queensland's regional innovation ecosystems, their strengths and future focus areas through regional plans

Canegrower embraces irrigation technologies to bolster **sustainability**

Steve Pilla is a Burdekin sugarcane grower who has become an early adopter of automated furrow irrigation across his whole farm.

For years, Steve followed traditional irrigation practices, routinely watering according to a 12-hour schedule based on assumptions, rather than evidence. Although he has always been curious about automation and attended local field days hosted by other canegrowers in the district, Steve felt he could continue to irrigate manually as he always had in the past.

‘I always thought I was too busy or occupied doing the day-to-day work on farm. One day, I decided that this was something I needed to do. My current practices were unsustainable,’ says Steve.

Steve joined the Burdekin Irrigation Project, a four-year project funded in partnership between the Australian Government’s Reef Trust and the Great Barrier Reef Foundation to support sugarcane farmers to transition to more efficient irrigation practices to reduce run off and deep drainage and improve productivity and profitability.

The project’s baseline assessment enabled evidence-based decisions to inform irrigation practice. Through active participation in the project, Steve says he now understands the importance of record keeping, measuring and monitoring, and using this data to make critical decisions on his farm.

‘I am now regarded as a farmer and businessperson, and I know where I assign value,’ Steve says.

Using the front-end online platform ‘Farm In One’, decisions can be based on live datasets. Steve says understanding

how to analyse the data on this platform, combined with the scheduling tool IrrigWeb, helps to inform him when to irrigate, rather than making the decision based on a hunch.

Data analytics tools and decision support systems are often seen by growers as high return on investment AgTech solutions. The AgTech used by Steve has progressed the farm towards achieving best management irrigation practices to improve or maintain yields, reduce electricity and water costs, deliver improved water quality outcomes and implement solutions to other agronomic constraints on his farm.

Steve says the power of the project as a catalyst for AgTech adoption and practice change has been the robust framework and the opportunity to work one on one with local irrigation experts.

‘I continue to be curious and implement new technologies and ways of working. The project has provided access to local products, technical back-up and industry knowledge, with all these contacts right here,’ Steve says.

‘I should have done it years ago.’



Activate innovation infrastructure



Outcome

Innovation infrastructure that supports the adaptation, adoption and export of AgTech

Queensland's programs and places, our innovation infrastructure, is driven by dedicated and passionate people positioned to advance AgTech. They provide access to research, training, mentoring, networking opportunities, workspaces, specialist equipment and technical expertise. By bringing knowledge, investment and talent together in places of innovation, we can optimise the use of existing AgTech products and services, produce new technologies, commercialise research, launch new business ventures, demonstrate return on investment and create new industries.

Examples of innovation infrastructure across Queensland include:

- Queensland Smart Farm, Gatton
- Central Queensland Smart Cropping Centre, Emerald
- Queensland AgTech and Logistics Hub, Toowoomba
- Goondiwindi Region Innovation Network
- Bundaberg AgTech Hub
- Regional Manufacturing Hubs across Queensland
- CQU Advanced Technology and Innovation Centre, Rockhampton
- Greater Whitsundays AgTech Hub
- Australian Tropical Science and Innovation Precinct, Townsville
- JCU Ideas Lab, Cairns
- The Precinct, Brisbane
- Ecosciences Precinct, Dutton Park
- Health and Food Sciences Precinct, Brisbane
- TAFE Toowoomba Rural Centre of Excellence.

Connectivity and internet speeds have also been raised as a barrier to the greater adoption of digital technologies. Building better regional connections and digital infrastructure requires all tiers of government, communities and the telecommunications industry to work together and deliver solutions for Queensland. There are also new government programs including Advance Queensland initiatives, digital devices and market players that are emerging and can provide digital connectivity solutions on-farm.

The Queensland AgTech innovation ecosystem will

Showcase AgTech innovation infrastructure on the innovation precincts and places portal and toolkit

Work with innovators and AgTech developers to ensure research and development is undertaken in an environment that is fit for purpose

Identify and create awareness of programs and initiatives that improve regional connectivity and digital solutions

Investigate approaches to increase accessibility of on-farm connectivity solutions across Queensland

Explore options to support an AgTech innovation infrastructure program to accelerate AgTech development and adoption

Amplify the Queensland Smart Farm Network to increase rates of technology adoption, adaptation and job creation in AgTech development and manufacturing

Inspiring innovation through a 'no boundary' workplace culture

EHS Manufacturing is a regionally based business, supporting the traditional mining and agriculture sectors through innovation.

EHS Manufacturing spent the first 10 of its 22 years in business reacting to immediate industry needs by manufacturing products to repair mining and agriculture implements. This 'business as usual' model dramatically shifted in 2016 when EHS Manufacturing developed its first international patent, thus owning the product it manufactured. This represented a shift from being reactive in its operations to a proactively driven, future-focused model.

'We wanted to fill a gap in the market and limit our competition. We did this by changing our customer demographic, providing a niche product through innovation and securing our own IP,' says Steve Lawn, EHS Managing Director.

EHS is at the forefront of innovative design and manufacturing of products that provide productivity gains and safe economical solutions to industries' challenges. As a leader in the AgTech ecosystem, an innovation culture is enabled across all employees, driven by the 'no boundaries' approach that has freely enabled creativity.

Steve says innovation at the workplace occurs by many minds working collectively to engineer and design products for market.

'If we work it out, it will work out,' Steve says.

Creating niche products requires a skilled and unique workforce, says Steve. The next generation of talent will be

attracted to careers at EHS Manufacturing as the work involves a balance of both academic and practical skills.

'We do what they love doing,' says Steve.

'Attracting young people who have the aptitude and cognitive ability to engineer and be creative, with a balance of practical trade skills of machinists, fitters and fabricators, is what our business is seeking.'

The business continues to grow and has expanded into an international market, exporting to over 14 countries. EHS Manufacturing now has three international patents in agriculture, with a fourth family of patents currently under development.

The mission of EHS Manufacturing is to build a successful company with the best people doing the job they love in a safe, healthy and fun atmosphere that they helped create.



Attract and build local capability



Outcome

AgTech capability and digital literacy within the Queensland agriculture sector is increased and supported by a talent pipeline

Rapid innovation and change across agribusiness value chains will require a range of new skills and capability. By 2029, more than 40% of jobs in agriculture will be transformed through the impact of technology, such as automation and augmentation. Modelling also predicts that one in three new jobs created in agriculture, forestry and fishing will be technology related.¹³

Maintenance of on-farm equipment will increasingly require skills in software, sensors and artificial intelligence, in addition to traditional mechanical skills.

While many agribusinesses rely on smartphones and computers in their day-to-day business, there are opportunities to further enhance digital literacy to expand into advanced technology solutions.

Growing the skills and capability of the Queensland AgTech innovation ecosystem will require building the skills of people already in agribusiness, attracting people with transferable skills from other sectors and jurisdictions, and preparing the next generation of workers through education programs and career pathways. As businesses navigate climate change while reducing their environmental footprint, creating pathways to assist individuals to innovate will be essential.

Increased investment in AgTech will accelerate growth in workforce demand and the subsequent need for higher level and flexible skills. To meet the demand for skilled workers now and into the future, the Queensland Government is developing a vocational education and training strategy to focus investment that provides priority skills in traditional and emerging industries.

The Queensland AgTech innovation ecosystem will

Support future career pathways into AgTech by working with stakeholders to understand current and future training needs, and advocating for the inclusion of AgTech in training and skilling programs

Undertake skills and training gap analysis highlighting existing support and opportunities for future education programs and career pathways in AgTech

Promote the diversity of emerging AgTech roles to attract and retain talent and skills in Queensland

Attract the next generation talent pipeline by leveraging school programs to expose students to AgTech training and work experience

Empower agribusinesses to support First Nations innovators, entrepreneurs and new entrants to grow a career within the sector through AgTech pathways

Increase agribusinesses' understanding of AgTech and digital literacy, including cybersecurity, and investigate approaches to increase capability through extension, training and business support services

Sky's the limit

This Queensland grazier has his eye firmly on the sky

When Queensland stockman Luke Chaplain set out to prove drones can offer a safer and more cost-effective alternative to helicopter mustering, little did he know the incredible journey he was about to embark on.

Based in Cloncurry on the family's Malakoff Station, Luke formed his AgTech company SkyKelpie in a bid to become the first person in the world to commercialise the use of drones to herd animals.

'It all started with a cheap little red drone I got in Hong Kong, when I was trying to get some heifers into the yards,' Luke says.

'We were having issues on the farm—it's hard to get labour, and helicopter mustering is quite expensive.'

The Department of Agriculture and Fisheries (DAF), Meat and Livestock Australia and Nuffield Australia have been supporting Luke's study of the use of drones for mustering livestock, using drones with special zoom and thermal cameras that assist in locating the animals, and aerial stockmanship techniques that keep the animals in a cooperative frame of mind, light and responsive to the drone.

Luke says the cost and safety benefits of using drones to muster livestock were just a few of the many benefits to the livestock industry.

The Australian Transport Safety Bureau said there had been 133 aerial mustering incidents reported since the start of 2010, but despite the obvious benefits of the technology, there are still some obstacles to be overcome.

Under current Civil Aviation Safety Authority (CASA) regulations, users must be able to see the drone at all times.

'That's a problem when you're mustering over thousands of hectares,' says Luke.

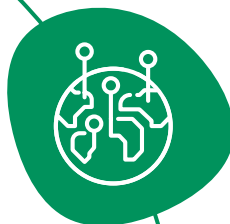
Luke became the first grazier in the country permitted by CASA to fly beyond visual line of sight over the family property for livestock mustering purposes, and is continuing to work with the authority to find a workable solution for agriculture, with the assistance of DAF.

Luke's SkyKelpie company continues to go from strength to strength, with Luke holding drone mustering schools across the country, selling drones, and developing online aerial stockmanship training and a livestock herding optimisation algorithm called 'LHOA', which one day might conduct autonomous musters.

Luke's passion for drone mustering was recently featured on [ABC's Landline program](#).



Connect to domestic and global opportunities



Outcome

Queensland is recognised as a global leader in AgTech, and a partner of choice in sustainable production and processing of food, fibre, foliage and other bioproducts

AgTech is attracting increasing attention as countries around the world face the challenge of feeding their populations and creating a sustainable future, including the global challenge of rapid decarbonisation. In 2021, an estimated \$115 million was invested into AgTech start-ups in Australia.¹⁴

With a key focus to be globally connected, using domestic markets as a springboard, we will create the environment for organisations to invest and bring their technology to Queensland. We will showcase Queensland's unique offerings, support our trading partners to do business in Queensland, and help Queensland innovators to take their AgTech products and services to the world.

Business export and accelerator programs, major events, delegations and innovation hubs, including Queensland Smart Farms, will help businesses to connect with these opportunities.

The Queensland AgTech innovation ecosystem will

Identify and foster investment and export opportunities in AgTech in Queensland

Build understanding of priority markets and key investors for Queensland AgTech

Work with key trading partners to advance Queensland as a global centre for AgTech through targeted inbound and outbound trade missions, including Brisbane 2032

Explore opportunities to showcase Queensland AgTech at global agricultural innovation events and attract major conferences to Queensland

Build export and investment capability of AgTech developers and service providers, and connect them with global networks

Clarify pathways and principles that support AgTech suppliers to achieve trade and investment outcomes

¹⁴ BDO analysis and reference materials from CB Insights during the compilation of the AgTech Roadmap, 2022.

Blue AgriTech

Revolutionising prawn farming

Queensland's prawn farming sector has grown significantly over the last five years. The sector is exploring innovative technologies and approaches to minimise environmental impacts while growing this important industry.

Tassal is Australia's largest black tiger prawn producer, with more than 350 people employed at Tassal's aquaculture facilities in tropical north Queensland during the peak season.

Blue AgriTech is Tassal's integrated Smart Farming Platform, comprising expertise, innovation and infrastructure that provides access to a multitude of different technologies for decision support and farm management.

'The availability of data 24/7 means that decisions on environmental management and prawn health are made in real time, and are proactive instead of reactive,' notes Michaela Krutz, Water Quality Manager at the Proserpine Prawn Farm.

Blue AgriTech provides real-time data, analysis and delivery of key management practices across Tassal's farming operations, including:

- acoustic auto-feeding
- 24/7 real-time water quality monitoring
- e-tech learning/algorithms
- smart water management systems
- environmental management and monitoring
- state-of-the-art water laboratories for nutrient analysis
- fibre optic networks to all ponds
- PLC/SCADA control system networks.

Blue AgriTech is founded on data-driven decision-making. Consistent and accurate data is monitored 24/7 via the central control centre, enabling management actions and

procedures to be based on real-time information. The farm employs people with a variety of skills not normally found in aquaculture, such as data analysts, PLC programmers and IT technicians, as well as the more traditional roles of water quality technicians, feed technicians and aeration crews.

'The conventional method of blowing feed into a pond was labour-intensive, unsafe and inaccurate. The new acoustic automatic feeding system delivers food to the prawns to satisfy their appetite while maintaining the highest levels of safety,' says Martyn Goodey, Farm Manager at the Proserpine farm.

Tassal's demand-based feeding is based on the acoustic response detected by underwater microphones, reducing waste, increasing productivity and improving water quality.

The ability to monitor water quality and water usage in real time has previously been challenging due to cost.

Leveraging technology created in its salmon operations, Tassal designed and implemented a bespoke network using the Supervisory Control and Data Acquisition (SCADA) platform powered by Microsoft business analytics, and other sensors and programming.

The SCADA system—the brains behind the infrastructure—monitors all water quality parameters, feeding, water use and aeration systems across all farming operations, and includes the ability to run the aeration system only when needed, reducing carbon emissions and allowing Tassal to lead the way in sustainable farming practices.

'Deploying Smart Farm technology has seen profitability improvements in feed costs, energy costs and environmental performance—the system has more than paid for itself, with the environmental benefits on top of that,' says Grant Purdon, Senior Manager, Farming Operations.



Coordinate for action



Outcome

An active Queensland AgTech innovation ecosystem underpinned by a coordinated approach to policy and programs

Coordinated effort and collaboration will facilitate the growth of AgTech in Queensland. No individual stakeholder group can effectively deliver what is needed for the rest of the AgTech innovation ecosystem; all stakeholders need to work together to capitalise on opportunities.

AgTech is a busy space, with action occurring at local, state and national scales, across sectors and for multiple purposes. Making this activity visible to people in a way that allows them to access and use what is relevant is critical in accelerating adoption and innovation.

Enabling permissioned information sharing, data and metrics across the innovation ecosystem will promote further research and development, technology availability and applicability, and trust in solutions.

By aligning and linking local, state and federal government initiatives, government agencies can work together to understand and leverage activities that enhance AgTech.

The Queensland AgTech innovation ecosystem will

Work with stakeholders to identify barriers in strategy, policy, planning and the legislative environment to enable modern agriculture practices

Identify government datasets that will benefit the AgTech innovation ecosystem and improve producer digital literacy

Lead activities to co-design and collaborate on policy and programs across all tiers of government, relevant sectors and private enterprises

Support activities to quantify the uptake and economic impact of AgTech in Queensland

Review scope of the AgTech Advisory Group to continue to champion innovation, connect innovation ecosystem stakeholders, and attract investment to accelerate adoption and development

Coordinate across government tiers, relevant sectors and private enterprises to optimise the co-benefits of AgTech for climate, biodiversity and natural capital, and to ensure environmental legislation and nature-related risks and dependencies are considered in AgTech development and application

Next steps

Working together across the agri-system to adapt, adopt and advance AgTech in Queensland and the world.

The roadmap is a strategic framework to encourage connections, collaboration and collective efforts to grow agriculture, AgTech and the agri-system in Queensland. To deliver on the vision, we are building on existing success—we have a strong foundation for key initiatives. We invite shared leadership and investment across all levels of government, and genuine collaboration with our partners.

Over the coming years, the roadmap will evolve as we assess progress against the objectives and key initiatives, and respond to new actions, partnerships and emerging innovations to ensure our approach continues to deliver for Queensland's agri-system.

It is essential to remain nimble in a fast-moving technology environment, working with innovators to explore and test new ideas, then adapting and improving to build on what works.

Government will continue to play a key role in Queensland's AgTech innovation ecosystem to:

- ensure the provision of trusted, independent AgTech knowledge alongside innovation and extension brokers, suppliers and growers leading change
- connect, collaborate and coordinate across the AgTech innovation ecosystem
- de-risk decisions for both the AgTech user to accelerate adoption, and the AgTech developer to support innovation
- provide an enabling framework and infrastructure that supports innovation investment, including the Queensland Smart Farms network
- support capability growth across the agri-system to adapt, adopt and advance AgTech
- foster a growth and innovation mindset, remaining technology agnostic, and keeping people at the centre of everything we do.

Detailed action planning is ongoing, with many key programs, projects and activities led by stakeholders across the AgTech innovation ecosystem well underway, while more are in development.

The Brisbane 2032 Olympic and Paralympic Games provide a significant opportunity for Queensland to showcase its high-quality agricultural produce and leverage global AgTech expertise. The Queensland Government's planning is well underway to ensure the opportunities are converted to impact.

In a highly dynamic context where change is the only constant, we will use the AgTech portal to ensure stakeholders remain up to date and well informed on this journey daf.qld.gov.au/agtech.



What can you do now?

Whether you are an agribusiness looking to engage with technology, a technology developer, a farmer with ideas, or providing services to the sector, there are a range of things you can do now to grow your journey.

Got ideas, want to connect and scale-up?

Contact any of your local innovation hubs and networks to connect with your local community, including the AgTech and Logistics Hub, or explore leading programs such as Farmers2Founders to expand your horizons.

daf.qld.gov.au/news-media/campaigns/agtech/contacts
agtechlogisticshub.com.au
farmers2founders.com

What upskilling is available?

A range of programs exist to assist people to understand, adopt and unlock the potential of AgTech within their business models. TAFE, UQ Skills, UniSQ and other opportunities can be found here.

daf.qld.gov.au/news-media/campaigns/agtech/education

What tech is available now?

Find a range of technologies through the AgTech Portal and AgTech Finder.

daf.qld.gov.au/news-media/campaigns/agtech/about/suppliers

Looking to find ways to adapt to a changing and more variable climate?

A range of decision-support resources and tools to support climate-resilient, sustainable agricultural production can be found on the Queensland Future Climate Dashboard and the Long Paddock.

longpaddock.qld.gov.au

Are there grant opportunities?

Stay in touch with financial assistance through the Queensland Government AgTech portal and the Queensland Government Grants portal.

daf.qld.gov.au/news-media/campaigns/agtech/funding
grants.services.qld.gov.au

Looking to invest or going global?

If you are investment and export-ready, contact Trade and Investment Queensland for a range of support and opportunities to connect with.

tiq.qld.gov.au

Want to stay up to date with the latest developments?

Investigate DAF's AgTech portal, evoke^{AG}. and its social feeds for the latest.

daf.qld.gov.au/agtech
evokeag.com





Glossary



Agribusiness professionals	Skilled people who assist clients to achieve their goals and provide solutions to problems. These include veterinarians, farm consultants, agronomists, fertiliser and stock company representatives, and those who on-sell products to local communities.	Innovation infrastructure	Physical and non-physical facilities, such as hubs, networks and demonstration sites, that are conducive environments that support innovation-focused activities.
Agricultural associations, communities and hubs	A cooperative network of agriculture stakeholders who represent and promote or advance the interest of their members and/or industry. This includes peak industry bodies, regional economic development organisations and networks.	Innovators and AgTech developers	A person who introduces a new method, idea or product. Someone who uses their skills to advance and integrate technologies to ensure they are working efficiently and applied to agriculture. Agripreneurs who turn an idea into a business reality are included.
Agri-system	The many interconnected economic, social and environmental components that contribute to food, fibre, fuel, health, biomanufacturing and foliage production. This includes the people, systems, inputs and outputs.	Investors	An individual, company or fund that puts money into an entity or activity for a financial return or advantage. AgTech investors include venture capital, angel investors, banking, corporate or accelerators.
AgTech	AgTech is any innovation used across the agribusiness and associated value chains (the agri-system) to improve efficiency, profitability, sustainability and credibility. It includes hardware and software, business models, new technologies and new applications.	Quantum communication	Includes ultra-secure communication protocols such as Quantum Key Distribution and communication channels within and between quantum computers.
AgTech user	Any person or business using technology that was commercialised to benefit agriculture. This includes agribusinesses and anyone using tech in the agri-system.	Quantum computing	Uses the quantum systems properties of superposition and entanglement to perform certain types of calculations exponentially faster than classical computers, making it possible to solve problems regarded as intractable until now.
Educators	A person or business that provides instruction and teaches someone to boost their ability or enhance their skills. This includes primary, secondary, tertiary and vocational teachers, registered training organisations, as well as those that teach through informal training pathways.	Quantum sensing	Harnesses the principles of quantum mechanics to achieve ultraprecise measurements of various physical phenomena such as time, gravity, magnetic fields, and biological and chemical signatures.
Environmental, social and governance (ESG)	A framework to assess an organisation's ability to act responsibly with respect to the environment, people and governance. Investors are increasingly demanding organisations outline their ESG framework and approach to assess the organisation's long-term sustainability.	Research organisations	An entity or group of people whose goal is to conduct research to create or investigate a method, product or process. This may be to generate new knowledge or to inform the tech's development. Includes universities, CSIRO, Rural Research and Development Corporations and private institutions.
Government	The democratic authority at a federal, state and local level. This includes departments, agencies and associated subsidiaries such as government-owned corporations and statutory bodies.	Roadmap	A strategic plan that defines a desired outcome and the major steps or actions needed to reach it. It also functions as a communication tool that helps explain the strategic thinking—the why—behind both the desired outcome and the plan for getting there.
Innovation ecosystem	A group of actors, activities and resources that are critical for innovation. Those who significantly contribute to the development and adoption of AgTech are part of the AgTech innovation ecosystem.	Value chain	Identifies the set of actors and activities that bring an agricultural product from production in the field to final consumption, where at each stage value is added to the product. The terms 'value chain' and 'supply chain' are often used interchangeably.

Connect with Queensland AgTech



 daf.qld.gov.au/AgTech
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We invite you to share
with your **AgTech network**



**Queensland
Government**