

Draft for consultation

# Queensland AgTech Roadmap

2023–2028

Queensland Legislative Assembly

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Tabled

By Leave

MP: Hon Furner

Clerk's Signature: [Signature]



Queensland  
Government



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 future 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 of pursuits, it should never be confused as one that has stood still. Queensland's producers live and work in an uncompromising environment and to survive they have always needed to be responsive. Throughout the history of our state, our producers have faced-down drought, floods, bushfires, and other extreme weather events. These events will become more commonplace as our climate changes.

Customer requirements and expectations are also changing. There will be continual change in the way we grow, produce, harvest, distribute and consume food, fibre, fuel and foliage. Agribusinesses will be looking for innovative solutions to meet these challenges and thrive in these changing times.

Queensland has a global reputation for high quality, safe and trusted agricultural products. We are home to many agripreneurs and innovators creating, developing, and maintaining technology used across the agricultural sector—AgTech. 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, with agribusinesses seeking out service providers that understand their business and local needs.

From its beginning, Queensland's agriculture sector has always been innovative and as we embrace and capitalise on the technologies and tools that are becoming available, we will continue to lead this transformation. Access to high-quality digital networks will enable a more individualised, integrated, and efficient digital economy.

AgTech will improve sustainable production of agricultural and value-added products that are trusted and verified in an ever-changing environment. We want growers and producers to be the early birds—the first to adopt revolutionary new technology, and the first to bring new products and services forward for Queensland to export to the world. Uptake of innovative digital technologies will ensure Queensland agribusinesses remain trusted in the domestic and global marketplace.

The draft Queensland AgTech Roadmap is for everyone, not only agribusinesses and innovators, but those who benefit from the business investment that follows. Together, let's make Queensland the natural home of AgTech for sustainable production that builds on investments already made in Queensland from other sectors into areas like clean energy, space, biotechnology, health and the digital economy.

I encourage you to join in the conversation and provide your views and suggestions on the draft Queensland AgTech Roadmap.

### **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 collaborations and advancing technological innovations Queensland will become a destination for world-leading AgTech.

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

As a leader of agricultural production and innovation, supported by productivity-enhancing economic and social infrastructure, Queensland is positioned to become a preferred destination for world-leading AgTech development and adoption.

Integrated AgTech solutions will transform global agriculture and drive productivity, sustainability, traceability, provenance, biosecurity preparedness and response, climate resilience and emissions reduction. Technology will also allow agribusinesses to definitively quantify their ESG (environmental, social and governance) impact as well as identify greater efficiencies.

Responding to the COVID-19 pandemic demonstrated more could be done digitally, prompting agribusinesses across the value chain to investigate alternative solutions to long-term problems—like labour shortages.

As agribusinesses use more digital technology, new skills and new jobs will be needed to support production systems and equipment. Simultaneously, new technologies will help rural, regional and First Nation Australian communities to stay connected, improving our Queensland lifestyle.

Accelerating digital transformation across Queensland's agriculture sector will ensure ongoing economic prosperity by meeting customer requirements and growing trade opportunities sustainably. The Brisbane 2032 Olympic and Paralympic Games sustainability commitments provide an unparalleled opportunity to showcase Queensland's low carbon and circular supply chains, high-quality food and fibre and AgTech expertise.

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<sup>1\*</sup>.

<sup>1</sup> BIS Research, 2022

\* Values converted from US\$ to A\$ on average 2021 F11 exchange rate data sourced from Reserve Bank of Australia.

This draft roadmap has been developed through extensive stakeholder engagement

Over  
**500**  
participants in  
engagement activities

Over  
**1000**  
individual insights

### AgTech Advisory Group

and Queensland Intergovernmental Steering Committee informing development and implementation

### Top 3 recommendations for improvement

case studies showing return on investment, increase understanding of AgTech, enhanced infrastructure to enable AgTech

# Our vision

Queensland's sustainable agrisystem is a global centre for AgTech.

To achieve this, we will need to:

- **Adopt** – have more agribusinesses capable of integrating AgTech.
- **Adapt** – increase commercial-ready technology that addresses key agribusiness challenges.
- **Advance** – transformation that benefits Queensland's economic, social, and environmental future.

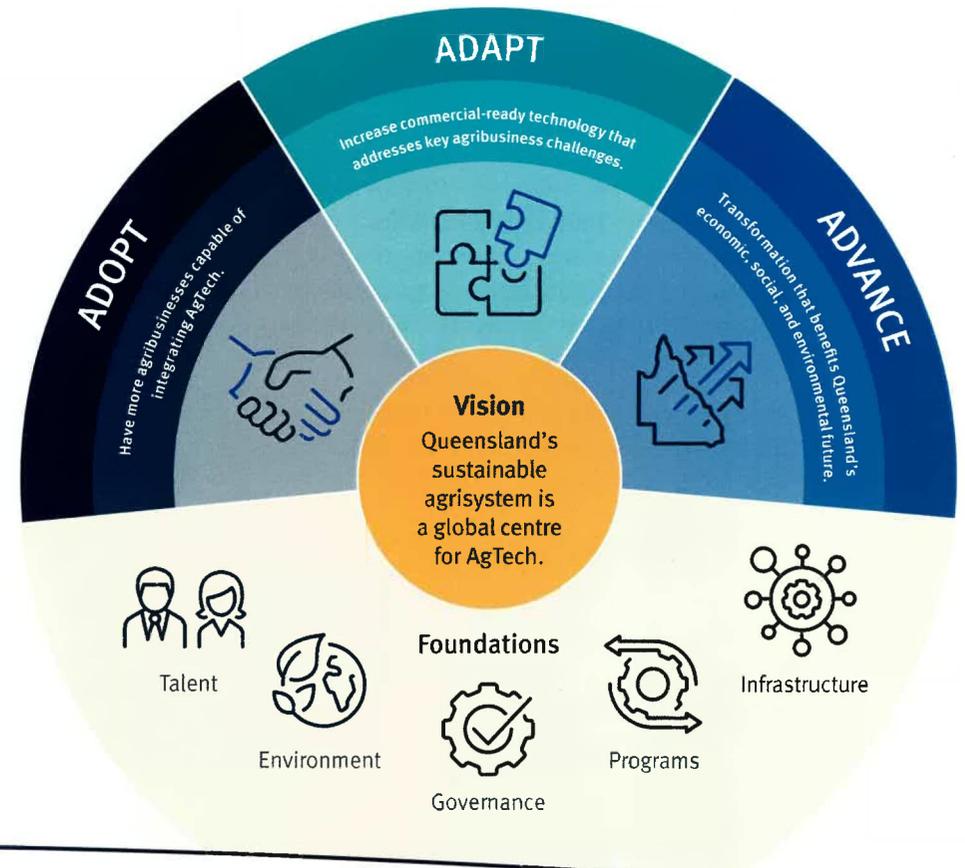
Working collaboratively, we will achieve our vision by focusing efforts on these five areas:

- Strengthen the innovation ecosystem.
- Activate innovation infrastructure.
- Attract and build local capability.
- Be globally connected.
- Coordinate for action.

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

- talented people in industry, academia, private enterprise and government
- diverse climatic environments that provide an excellent sandpit for testing
- trusted governance arrangements across the value supply chain
- targeted programs for key government and industry priorities
- cutting-edge and regionally distributed common user infrastructure.

*This framework was developed with comprehensive stakeholder input and analysis, and will inform the actions outlined in the roadmap.*



## Roadmap



### KEY FOCUS AREA 1 Strengthen the innovation ecosystem

A connected and collaborative AgTech innovation ecosystem in Queensland



### KEY FOCUS AREA 2 Activate innovation infrastructure

Innovation infrastructure that supports the adaption and adoption of AgTech



### KEY FOCUS AREA 3 Attract and build local capability

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



### KEY FOCUS AREA 4 Be globally connected

Queensland is recognised as a global leader in the development, commercialisation and adoption of AgTech through strengthened trade and investment connections



### KEY FOCUS AREA 5 Coordinate for action

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

# Current state of agriculture

The Queensland agribusiness and food sector contributes significantly to Queensland's economy, regions and communities. It has a key role in providing safe, sustainable food and other commodities to an increasing world population.

Queensland's primary industry commodities were estimated to be \$23.66 billion in 2021–22, and account for approximately 10% of Queensland's overseas exports. The industry employs more than 372 000 people across the agribusiness supply chain<sup>2</sup>.

More than 80%, Queensland has the highest proportion of land area in Australia managed for agriculture and the largest area of agricultural land of any Australian state or territory<sup>3</sup>.

Queensland will be a significant contributor to the Australian agriculture sector's ambition to become a \$100 billion industry by 2030. Technology development and adoption will be a key accelerator of sector growth. The Australian Agritech Association is driving to see the AgTech sector contribute \$20 billion to this \$100 billion national target<sup>4</sup>.

## AgTech in Queensland

Queensland is positioned to be a leader in AgTech innovation through:

- leading agribusinesses exporting globally
  - a diverse mix of crops, livestock and climatic zones ensuring AgTech can be developed and tested to withstand a range of conditions
  - developed and advanced common user infrastructure (ports, roads, rail, connectivity)
  - investment in clean-energy security
  - world-leading food, agriculture, health, biosecurity, space, biomanufacturing, energy, resource recovery research and development with Queensland universities, research institutions and businesses with cutting-edge technologies that have a strong commercialisation potential
- an expanding network of innovation hubs and enabling services and programs
  - a growing startup innovation ecosystem with commercial-ready products and services
  - access to transferable technologies, skills, services and innovation from manufacturing, finance, health, mining and defence sectors.



<sup>2</sup> Queensland Department of Agriculture and Fisheries, Data Farm, 2022

<sup>3</sup> DAF 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)

<sup>4</sup> Australian Agritech Association, April 2022

# Drivers and opportunities

With an outlook to 2042, CSIRO has released their Our Future World report, which explores the geopolitical, economic, social, technological and environmental forces unfolding around the world, which will impact Australia's people, businesses and governments. Adapting to climate change, reducing emissions, health risks, geopolitical shifts, digitisation, automation and consumer demands will drive global disruption over the next 20 years.<sup>5</sup>

These challenges bring opportunities for Queensland agribusinesses to innovate. AgTech will be an intrinsic part of modern and future agriculture, solving problems and growing business. The 2022 McKinsey Technology Trends Outlook has identified several key technologies that can assist businesses to lift productivity and business credentials.

Key technologies that are direct benefit to agribusiness include applied artificial intelligence, bioengineering, advanced connectivity, clean energy, mobility, machine learning, immersive reality, as well as trust architectures and digital identity for provenance and cybersecurity.

## Meeting marketplace demands

Consumers, markets and producers are demanding improved production and quality of food and fibre products, transparency along the value chain, lower carbon emissions, environmental sustainability, and social outcomes for regional, rural and First Nations Australian communities. The modern consumer also has an interest in supporting local communities and economies by understanding where the food they consume has come from and how it was produced.

AgTech will play a critical part in enabling producers to differentiate themselves in global markets and demonstrate their environmental and social credentials including credible evidence of the quality and safety of the product delivered to the consumer.

## Food security

Global demand for food production is projected to increase by more than 50% by 2050<sup>6</sup>. Improving food security for Queensland, our region and the world requires accelerated adoption of AgTech throughout the value chain.

AgTech will:

- unlock improvements in on-farm productivity
- combat pests and diseases
- shorten and improve the resilience of the supply chain to disasters and events
- improve longevity of fresh and processed food.

## Reducing the global footprint

AgTech will play a critical role in meeting the growing demand for agricultural products while minimising environmental impacts. Technological solutions can be applied across the value chain to minimise and optimise use of chemical inputs; improve circularity and reduce waste; improve soil and water management; develop alternative products, processes and industries (e.g. food innovation, energy, nutraceuticals); adapt and respond to climate change through the utilisation of renewables and carbon farming; and provide traceability that can prove environmental credentials.

Decarbonisation of all industries is a global imperative. Queensland has a target of a 30% reduction in emissions below 2005 levels by 2030, zero net emissions by 2050, and powering Queensland with 50% renewable energy by 2030, 70% by 2032, and 80% by 2035. The Queensland Low Emissions Agriculture Roadmap 2022–2032 identifies 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.

International and local markets and consumers are also increasingly requiring improvements in environmental sustainability, including soil health, pesticide and fertiliser use, animal welfare and food waste. AgTech will continue to play an important role in protecting and managing sensitive environments, including the Great Barrier Reef, by improving land management practices which reduce soil and nutrients flowing into local waterways.

<sup>5</sup> CSIRO, Our Future World: Global megatrends impacting the way we live over coming decades, 2022

<sup>6</sup> World Resources Institute, World Resources Report: Creating a Sustainable Food Future, 2019

## New jobs

Many of Queensland's geographically diverse communities are based around agriculture and its associated value chains. Providing a wide range of jobs and developing a workforce with relevant skills is critical to these communities. Integration of AgTech throughout the agribusiness value chain will attract people with different skills and backgrounds into the industry, including people with skills in technology and those with expertise in adapting innovations from other sectors including space, health and quantum science.

AgTech also has the potential to enable people with different capacities and abilities to participate more fully in the agribusiness value chain, by facilitating remote management and reducing dependence on manual tasks. Building and diversifying the skills of existing agribusiness employees will help them to adopt AgTech, integrate it with existing systems, and use data in business operations and decisions.

## Healthy people

Improved access to health and nutritious food contributes to improved health outcomes — and technology can help us get there.

Food, medicine and agriculture are connected and advanced technologies, like machine learning, artificial intelligence and genomics, are helping us to see how. Where it previously took centuries to discover the connection between nutrition and medical conditions, we are now able to unlock new connections between nutrients and health at an incredible pace.

\* Values converted from US Dollars to Australian Dollars based on average 2021 F11 exchange rate data sourced from Reserve Bank of Australia.

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

## Cybersecurity and trusted data

Agribusiness sector adoption of new and enhanced technologies brings with it new challenges to be managed. The *Australian Cyber Security Centre Threat* report for 2020–21 identified that there were 67 500 cybercrime reports of which one quarter affected entities associated with critical infrastructure.

Digital-trust technologies will help organisations manage data risks, protect assets and help accelerate adoption.

## Attracting investment

The Queensland Government and its people are stewards of Queensland's abundant natural, human and capital resources for future generations. Increasing global expectations requires the state to demonstrate its approach to considering ESG risk factors and sustainability issues in its decision-making.

Investments and advancements in AgTech adoption and development will continue to contribute 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. In Australia, an estimated \$115 million was invested into AgTech start-ups in 2021 across 14 venture deals<sup>7</sup>.

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.



# Building on strategic directions

The roadmap links with other Queensland and national strategic plans and initiatives.

## Queensland

- Climate Positive Brisbane 2032 Olympic and Paralympic Games
- State Infrastructure Strategy 2022
- 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
- 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 and roadmap and action plan
- Queensland Energy and Jobs Plan
- Low Emissions Agriculture Roadmap 2022–2032
- Good people. Good jobs: Queensland Workforce Strategy 2022–2032

## National

- Digital Foundations for Agriculture 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

## Global

- United Nations Sustainable Development Goals



## Solving connectivity with a 'towering' solution

When it came to solving an issue of internet connection, farmer Andrew Sevil decided to build and install his own 53 metre tower on his farm, 20km north of Dirranbandi.

Andrew runs a 6000-hectare property producing mainly wheat and cotton and also running beef cattle. The AgTech solution was born out of 12 months of extensive planning and the commissioning of an engineer to custom build the tower.

With the tower up, the mobile network has increased internet speeds from only a few megabits per second to around 50.

With the wi-fi issue solved, Andrew used his out-of-the-box thinking to overcome further issues using AgTech.

'The second problem was we wanted to stretch that data around the property so that we could communicate from our vehicles and tractors, and be able to have that sort of ability farm wide, not just at one point at the house,' he said.



'So if I've got employees on the tractor and they have a breakdown they can call me up, and send me a photo, without any cellular reception whatsoever,' he said.

'It's through a wi-fi network on the property. So that provides real peace of mind with regard to OH&S.'

Improving connectivity also enabled them to establish an effective monitoring network through sensors and cameras to check electric fences, irrigation systems and troughs, without needing to travel to them. Andrew said all data now links through to the tower back to the house.

It takes an ecosystem to scale an innovation.

# Building connections in the innovation ecosystem

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 agrisystem. New 'left field' players, including those from other sectors, help inspire and challenge traditional thinking and approaches being adopted in the agricultural sector and related value chains.

Queensland has a well-established innovation ecosystem with a selection already focusing on innovation for agricultural challenges. Interactions and investments between organisations, individuals and communities involved in the development and adoption of AgTech is evident within and

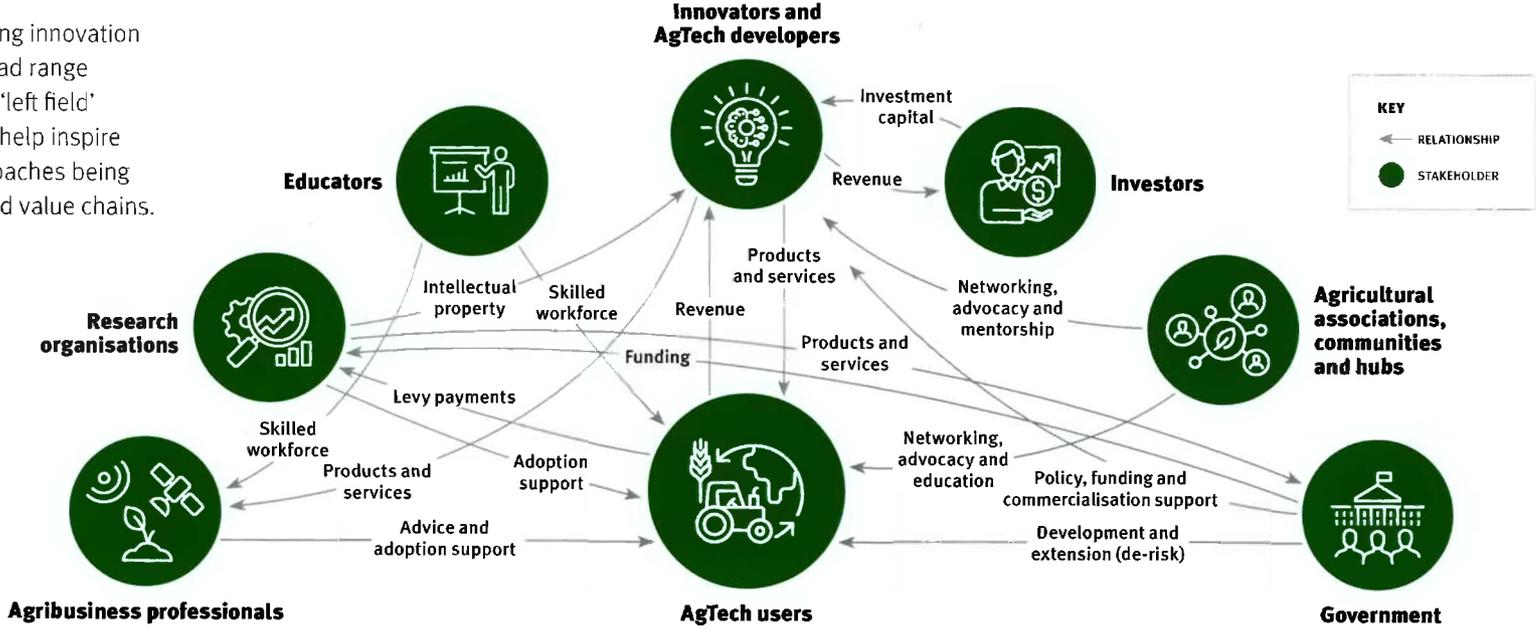
outside the agrisystem. The agriculture sector is well placed to leverage technology solutions being developed in Queensland for other sectors such as defence, aero-nautical science, low emissions energy and health.

Queensland has a strong foundation of research, development, extension and innovation. Significant Queensland Government investment has been made through 'Advance Queensland', 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.

**The AgTech innovation ecosystem includes all the organisations, individuals and communities involved in the development and adoption of AgTech.**

Connect with the AgTech community [daf.qld.gov.au/agtech](http://daf.qld.gov.au/agtech).



## Connecting talent, technology and the AgTech innovation ecosystem

Opened in 2020, the Agtech and Logistics Hub brings together the best talent and technology to help businesses solve their challenges, commercialise and grow.

The hub's diverse directory of experts is growing fast. Its valued connections include more than 6500 contacts, 1000 active small and medium enterprises, 400 active corporate partners and Venture Capital (VC) funds.

Unique programs offered through the hub are specifically designed to give established and emerging businesses the best opportunity to thrive in challenging market conditions. Currently three innovative programs are delivering on the hub's goal to fast-track the development and adoption of AgTech.

These programs include:

- **OpenGround** – a challenge-led collaborative program that helps businesses look inward and externally to discover, acquire or partner with talent and technology.
- **GainingGround** – a cutting-edge program to fast-track the development of breakthrough products, solutions, business models and go-to market strategies. It provides businesses access to facilities, designers and specialists across technology, research and science.
- **GroundUp** – specifically designed for the agribusiness community offering guidance and support to businesses looking to take their technology to the next level. The AgriFood Accelerator program is tailored for later stage startups, scaleups, and small and medium-sized enterprises with a product or service offering that's commercially viable. Through this program, the hub facilitates field demonstrations access to mentors, VC funds, global networks and coworking spaces.



The hub has quickly built a strong reputation both nationally and internationally. Australia's largest fruit and vegetable grower, Costa joined the Agtech and Logistics Hub's Open Innovation Challenge to reduce inorganic waste in the horticulture industry.

World-class educational sessions and events are hosted regularly featuring the best speakers and AgTech content. The meet-ups and demonstration days are also popular in bringing the innovation ecosystem together.

These help startups, entrepreneurs, industry experts and government to connect and discover real-world solutions in the agrifood sector.

Shared spaces at the hub offer modern, connected facilities, and 'Co-working Wednesdays' open up collaboration opportunities with innovators and entrepreneurs.

The AgTech and Logistics Hub is funded by the Queensland Government in association with the FKG Group, University of Southern Queensland and the University of Queensland.

## The roadmap

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



Key focus areas:



### Strengthen the innovation ecosystem

A connected and collaborative AgTech innovation ecosystem in Queensland



### Activate innovation infrastructure

Innovation infrastructure that supports the adaption and adoption 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



### Be globally connected

Queensland is recognised as a global leader in the development, commercialisation and adoption of AgTech through strengthened trade and investment connections



### Coordinate for action

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

# Strengthen the innovation ecosystem



## What we want to know

Tell us what you think about the actions in the draft roadmap.

Who should lead and support the key actions?

## Goal

### **A connected and collaborative AgTech innovation ecosystem 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 agrisystem.

Innovation ecosystem builders actively forge connections and share ideas, investment and innovation across individuals, organisations, researchers and investors. Supporting these builders to work both within their own local system and to connect with each other, will promote trust and confidence for the adoption of emerging AgTech innovations.

## Key actions

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Support extension activities to increase confidence and trust in AgTech

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

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Create a pathway to enhance First Nation Australians' participation in the innovation ecosystem

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

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

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Build an understanding of Queensland's regional innovation ecosystems, their strengths and future focus areas through regional plans

## Artificial intelligence solution leads to herbicide reductions

InFarm is an artificial intelligence company pioneering the development of ground-breaking drone-to-tractor weed identification technology.

The company's platform is enabling large farms in south-western Queensland to achieve savings of up to 97.5% in herbicide use on farm.

InFarm's technology unlocks big data and provides farmers direct access to technological advances and artificial intelligence (AI), enabling increases in both profitability and sustainability.

InFarm's fallow weed product maps integrate with existing variable rate sprayers. This eliminates the need for additional capital expenditure, providing significant cost-savings for farmers.

'The way the drone-to-tractor solution works is pretty simple... we fly the paddock using a drone, from there we upload those images into our processing platform, where we apply our AI,' InFarm managing director Jerome Leray explains.

'From there we produce a tractor-ready file, that can be integrated with your standard variable rate tractor.'

Luke Arbuckle, who farms 100 km west of Goondiwindi, says the technology is providing notable benefits with efficiencies.

'Personally, where the technology has the greatest impact in terms of efficiencies is using the terrain mapping to help with water infiltration,' he said.

'This has influenced tilling and farming direction in paddock, whereby I've been able to remove low-productive acreage and shift fences to prevent ineffective farming and decrease compaction.'

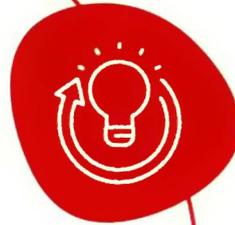
Luke says he is excited about future possibilities with AgTech.

'I've started my career with GPS steering on the tractor, and now I use innovations like AI and big data to help with the management of my paddocks,' Luke says.

'I can't wait to see where this innovation continues to go, and the benefits it's going to continue to bring.'



# Activate innovation infrastructure



## What we want to know

Tell us what you think about the actions in the draft roadmap.

Who should lead and support the key actions?

## Goal

### Innovation infrastructure that supports the adaption and adoption of AgTech.

Queensland's programs and places—our innovation infrastructure—driven by dedicated and passionate people, are 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
- Whitsundays AgTech Hub, Mackay
- Australian Tropical Science and Innovation Precinct, Townsville
- JCU Ideas Lab, Cairns
- The Precinct, Brisbane
- Health and Food Sciences Precinct, Brisbane.

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 telecommunication industry to work together and deliver solutions for Queensland. There are also new government programs, digital devices and market players that are emerging and can provide connectivity digital solutions on-farm.

## Key actions

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

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

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Investigate approaches to create awareness of on-farm connectivity solutions across Queensland

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Identify programs and initiatives that improve regional connectivity and digital solutions

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

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

## AgTech in action

Queensland Smart Farms strive for success through investment in people. While investment in technology is imperative to data delivery—it is the people who will use the data to provide value and information, and support industry transformation.

Queensland Smart Farms are dedicated to advancing Australia's agriculture and food industries through AgTech innovation. They are test beds to trial and demonstrate the use and benefits of AgTech, de-risking investment decisions and supporting action on climate change and sustainability.

The Smart Farms will accelerate adoption and adaptation of technology within industry and create jobs in AgTech development and manufacturing.

Queensland Smart Farms combine world-leading research, development and extension programs with state-of-the-art facilities and established industry networks.

Queensland currently boasts two Smart Farms—one at Gatton (initial focus on protected cropping and post-harvest technologies) and one at Emerald (initial focus on broadacre

cropping). The Queensland Government has invested \$5.8 million in the Emerald Smart Farm and \$9 million (including \$2.1 million co-investment by Horticulture Innovation) in the Gatton Smart Farm to increase capability and capacity of our people through developing skills and career pathways.

Our Smart Farms programs and initiatives are co-designed by government, industry, AgTech providers, producers, supply-chain businesses and researchers.

[daf.qld.gov.au/smartfarms](http://daf.qld.gov.au/smartfarms)



# Attract and build local capability



## What we want to know

Tell us what you think about the actions in the draft roadmap.

Who should lead and support the key actions?

## Goal

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

Rapid innovation and change across the agribusiness value chain 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<sup>8</sup>.

Maintenance of on-farm equipment will increasingly require skills in software, sensors and artificial intelligence, in addition to traditional mechanical skills. Growing skills and capability within the Queensland AgTech innovation ecosystem requires people with transferable skills from other sectors and jurisdictions, building the skills of people already in agribusiness, and preparing the next generation.

While many agribusinesses rely on smartphones and computers in their day-to-day business, limited digital literacy has impacted opportunities to expand into advanced technology solutions.

## Key actions

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

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

Investigate approaches to improve cybersecurity literacy in agribusinesses

Increase agribusinesses' understanding of AgTech and digital literacy, including cybersecurity, through extension, training and business support services

Identify and empower First Nations Australian innovators and small businesses to support young people to enter and build a career within the agribusiness sector

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

Explore the development of an incentive program to attract talent to the regions



## On-farm app reduces work health and safety paperwork

CHRRUP Limited is helping farmers digitise essential work health and safety (WHS) procedures.

The organisation's Safe Station™ app allows agricultural property owners and operators to do away with paper-based WHS processes through an individualised safety management system.

Funded by a Queensland Government Agribusiness Digital Solutions Grant in 2021, the Safe Station app has been adopted by more than 30 Queensland businesses.

Users can access vital safety information, logs such as for chemical usage, and incident reports anywhere, anytime.

Kerryn Piggott, Owner of Christmas Creek Cattle Company, south-east of Emerald says the app is helping save considerable time with on-boarding contractors and safety-related tasks.

'The positive impact is time,' Kerryn says.

'The app is right there in your hand. Everybody is on the same page in the business. It's not a paper trail, it's just a tap on the app.'



Kerryn Piggott, Owner of Christmas Creek Cattle Company and CHRRUP Limited CEO Simone Parker.

# Be globally connected



## What we want to know

Tell us what you think about the actions in the draft roadmap.

Who should lead and support the key actions?

## Goal

**Queensland is recognised as a global leader in the development, commercialisation and adoption of AgTech through strengthened trade and investment connections.**

AgTech is attracting increasing attention as countries around the world face the challenge of feeding their populations and creating a sustainable future. In 2021, an estimated \$115 million was invested into AgTech start-ups in Australia<sup>9</sup>.

Positioning Queensland's unique offerings in the global AgTech marketplace will allow Queensland to capture a greater portion of the global AgTech investment, create the commercial environment for organisations to invest and bring their technology, and support Queensland based organisations to take their AgTech to the world.

The Brisbane 2032 Olympic and Paralympic Games provide a significant opportunity for Queensland to showcase its high-quality agricultural produce and AgTech expertise with the increased demand for local produce, demonstration of climate positive supply chains, and the eyes of the world on the state.

## Key actions

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Work across industry sectors to identify investment and export opportunities in AgTech in Queensland

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Build understanding of priority markets for Queensland AgTech and foster relationships with key trading partners through targeted inbound and outbound study missions

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Leverage the Brisbane 2032 trade and investment program as an opportunity to showcase Queensland capabilities in AgTech

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Explore opportunities to attract major AgTech innovation conferences to Queensland

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

<sup>9</sup> BDO analysis and reference materials from CB Insights during the compilation of the AgTech Roadmap, 2022

## Digitising agronomy and saving costs

Toowoomba-owned technology company DataFarming's Digital Agronomist™ platform is supporting 40% of Australian grain farms, covering 120 000 fields across 50 countries, and 35 million acres that have been digitally mapped.

DataFarming is owned by Australian precision agriculture specialists, Tim and Peta Neale, who launched the cloud-based Digital Agronomist platform in October 2017.

It provides global access to 10 metre satellite maps with normalised difference vegetation index (NDVI) satellite data. NDVI is an index of plant 'greenness' or photosynthetic activity and shows the health of a crop or pasture.

The satellite images allow farmers to track crop or pasture performance, with images updated every five days. An auto-zone feature of the technology helps to balance soil and crop needs in different areas, zone paddocks and upload shape files into farm machinery systems.

Julian Cross, a farmer near Kingaroy in Queensland, has made reductions with fertiliser application since using the DataFarming platform.

'It gave us another layer of crop variance through the fields,' Julian said of the technology.

'We then did some tests on different areas looking at water-holding capacity and nutrient levels. We now put more fertiliser down on good areas and less on poor areas. We have ended up applying 30 kilograms per hectare less than we used to.'

Julian is now a convert to variable-rate use. 'Now I know how simple and easy it can be,' he said.

'We've now done maps in all crops. I was wasting money on poor areas but will put money where the best bang for our buck is.'



# Coordinate for action



## What we want to know

Tell us what you think about the actions in the draft roadmap.

Who should lead and support the key actions?

## Goal

**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 the sharing of information, 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.

## Key actions

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



# Glossary

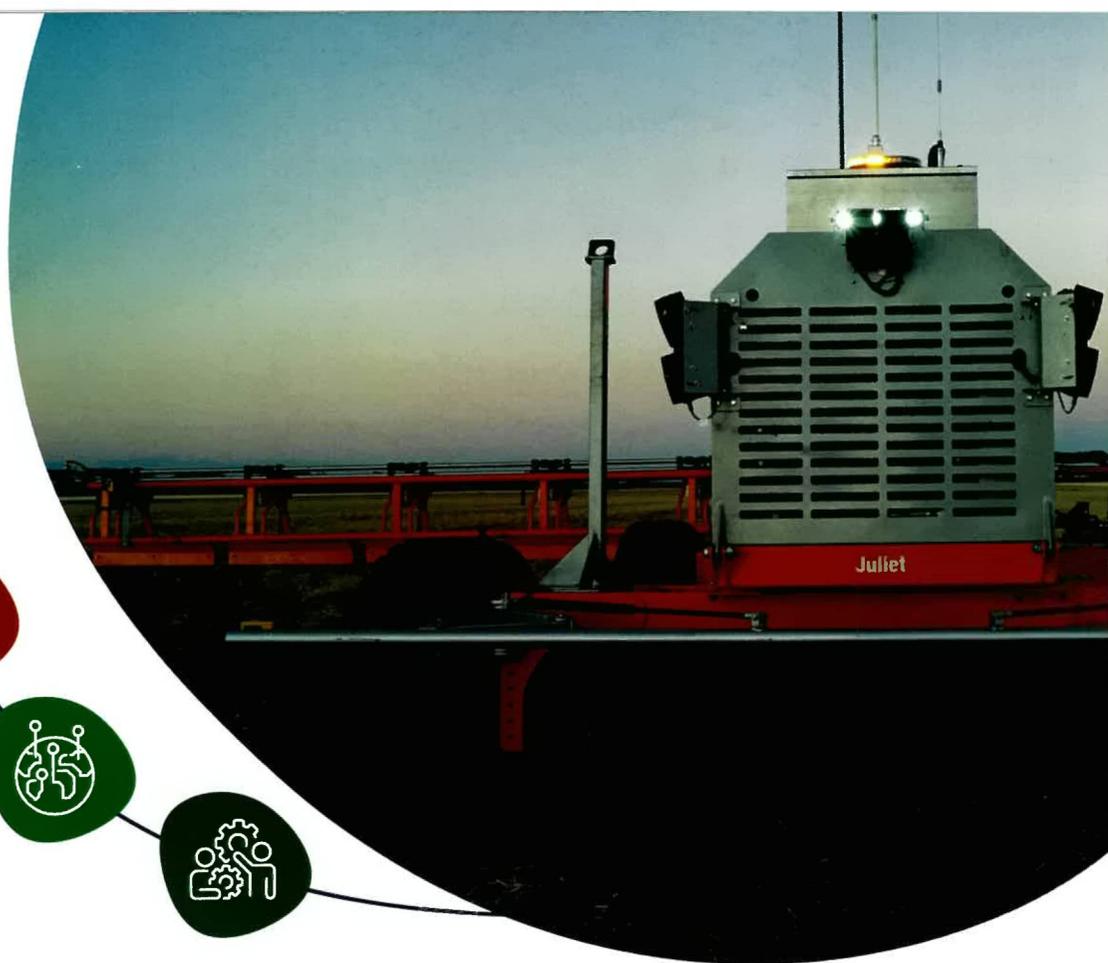
<b>Agribusiness professionals</b>	Skilled people who assist clients to achieve their goals and provide solutions to problems. These include veterinarians, farm consultants, agronomists, fertiliser and stock company representatives, and those who on-sell products to local communities.	<b>Innovation ecosystem</b>	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.
<b>Agricultural associations, communities and hubs</b>	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.	<b>Innovation infrastructure</b>	Physical and non-physical facilities, such as hubs, networks, demonstration sites, that are conducive environments that support innovation-focused activities.
<b>Agrisystem</b>	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.	<b>Innovators and AgTech developers</b>	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.
<b>AgTech</b>	AgTech is any innovation used across the agribusiness and associated value chains (the agrisystem) to improve efficiency, profitability, sustainability and credibility. It includes hardware and software, business models, new technologies and new applications.	<b>Investors</b>	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, banking, corporate, or accelerators.
<b>AgTech user</b>	Any person or business using technology that was commercialised to benefit agriculture. This includes agribusinesses and anyone using tech in the agrisystem.	<b>Research organisations</b>	An entity or group of people whose goal is to conduct research to investigate a 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.
<b>Educators</b>	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.	<b>Roadmap</b>	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.
<b>Environmental, Social, and Governance (ESG)</b>	ESG is used as a framework to assess an organisation's ability to act responsibly with respect to the environment, people, and governance. Investors are increasingly demanding organisations to outline their ESG framework and approach to assess the organisation's long-term sustainability.	<b>Value chain</b>	A 'value chain' in agriculture 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.
<b>Government</b>	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.		



# Collaborate with us

Tell us what you think about the actions in the draft roadmap, across the five focus areas:

- Strengthen the innovation ecosystem
- **Activate innovation infrastructure**
- **Attract and build local capability**
- Be globally connected
- Coordinate for action



## How to have your say

- 1 Read the draft AgTech Roadmap
- 2 Have your say at the **Department of Agriculture and Fisheries eHub**  
[daf.qld.gov.au/agtech-roadmap](https://daf.qld.gov.au/agtech-roadmap)
- 3 Complete the survey



### How to use the Queensland Agriculture and Fisheries eHub

If you are already an eHub user **log into your account** and join the conversation via the 'draft Queensland AgTech Roadmap 2023–2028 consultation' tab.

If you are new to eHub, simply take a couple of minutes to **register** and then join in the conversation.