#farmingsmarter

Cooperative Research Centre

RINPAS

Innovations for on-farm systems

IMPROVING FARM
PRODUCTIVITY AND
PROFITABILITY BY

#farmingsmarter

FARMING SMARTER

Australia is well placed to become a leader in agricultural technology and innovation

Our proximity to high-growth export markets in Asia as well as our ongoing reputation for food quality and safety represent significant competitive advantages for our primary industries. However, these opportunities can only be realised if Australia's on-farm productivity growth can keep pace with our global competitors, and environmental and social constraints.

It is now well understood that in the decades to come, agricultural markets will be characterised by a significant increase in global demand, coupled with unprecedented environmental pressures. In order to respond to these challenges, innovative farming systems are required to ensure primary producers can both maximise yield, while optimising the use of agricultural inputs.

The emergence of 'precision agriculture' in recent years has opened up opportunities to drive substantial and long-term profitability and productivity growth in the sector.

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An agricultural technology industry that targets farmers, consultants and services providers is now expanding, with the commercialisation of a range of applications and equipment that are primarily designed to:

- Enhance farm management decision-making and capability through the monitoring and control of production;
- Reduce exposure to risk and manage variability throughout crop and livestock operations;
- Improve the efficiency of field operations through the precise application of farming inputs at the optimal location and time.

These technologies and associated practices have the potential to deliver real returns for primary producers against a backdrop of ever increasing social and regulatory compliance requirements, ageing farmer populations, labour shortages, climate change, rising costs and falling commodity prices in relative terms.

A 'solutions design' approach

Delivering fit-for-purpose precision farming technologies is the primary purpose of the Farming Smarter CRC.

To ensure the Centre's R&D activities align directly with industry requirements and deliver products specifically adapted to real on-farm conditions, projects will be led by Solutions Design Teams. These teams will comprise the necessary skills and capabilities to provide a solution to the defined problem and an outcome that benefits Industry.

Industries outside the farm sector will be engaged in transitioning technologies and practices into agriculture for example mining and urban planning. R&D programs will be delivered using agile project management methodologies—placing end-users squarely at the centre of the process.

Key considerations for #farmingsmarter

- System integration
- Data and platform standards
- Connecting people; not just technology
- 'Plug and play' ease-of-use
- Data privacy and security
- Environmental and social compliance
- Supply chain efficiency
- Automation and remote farm management
- Cost barriers to adoption
- Communication networks
- Skilled workforce

The Farming Smarter CRC is an opportunity to partner and collaborate with other segments of the industry to deliver breakthrough advancements in farm management and practice.


future
family
education
environment
change
social networks
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finance
health
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fertiliser
animal welfare
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land
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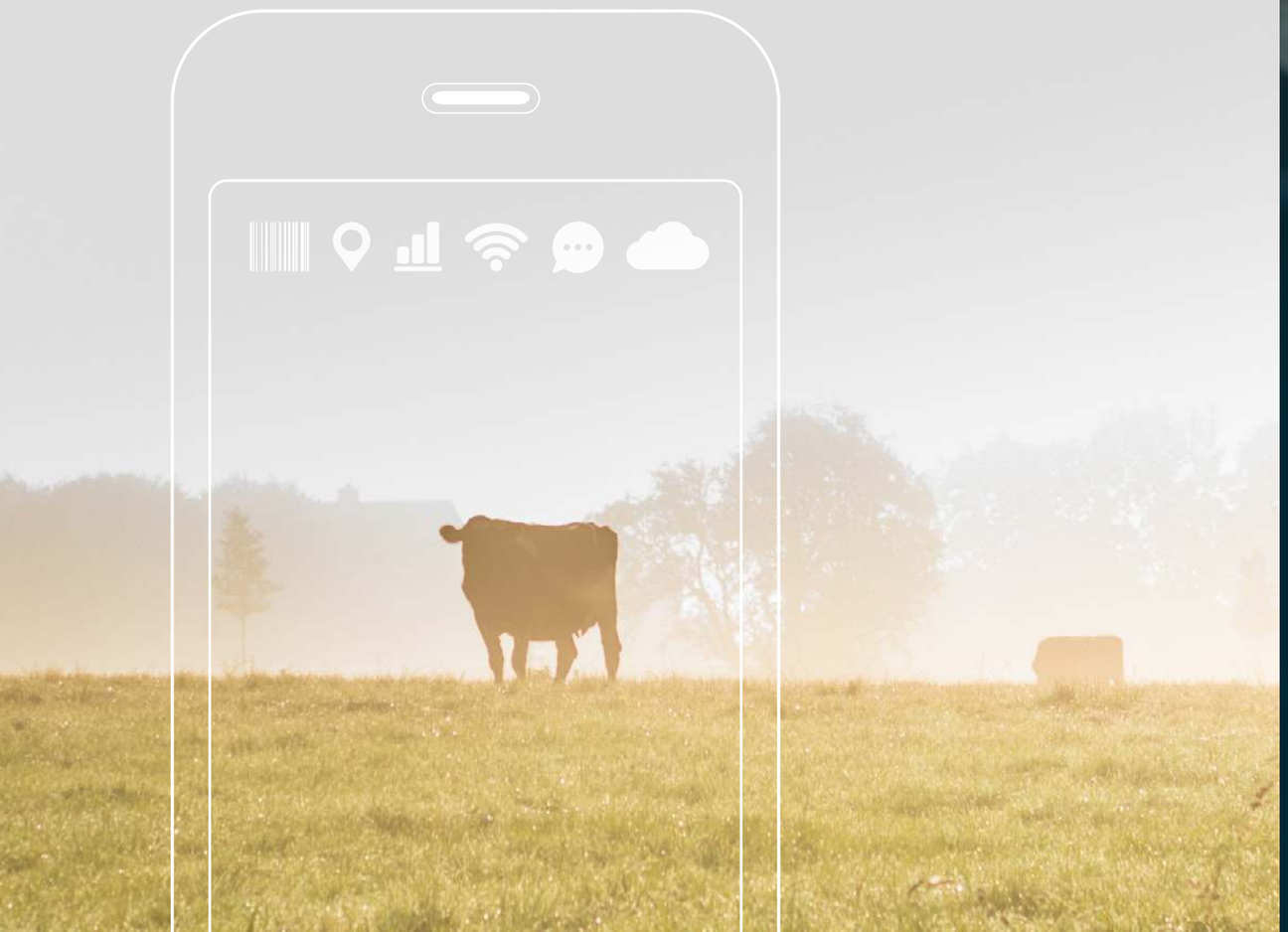
wellbeing
professional networks
climate change
productivity
labour
pressure
capital
training
pest and diseases
upskilling
cost of production
water
succession planning
trust
drought
value chain

Developing fit for purpose technologies to manage production and market risks

Securing social licence to operate

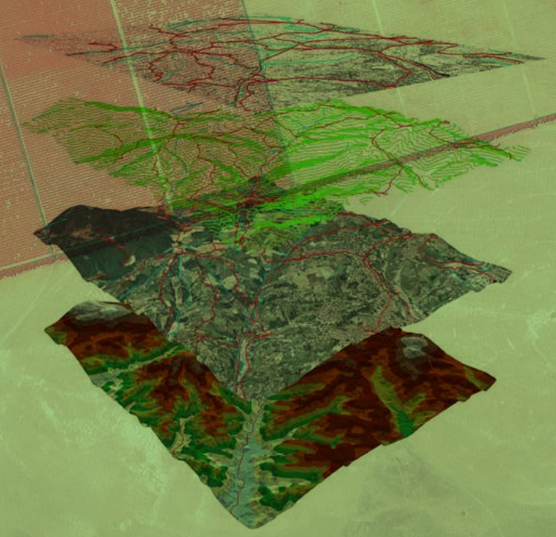


Linking on-farm data with business platforms to support evidence-based financial management

Improving environmental stewardship and resource management

Target sectors

The purpose of the Farming Smarter CRC is to target the development and implementation of technologies and practices that have cross sector-utility in areas such as:



△ **Livestock Production & Dairy**

Intensive and extensive livestock production in temperate and tropical Australia

△ **Broadacre Cropping**

Cotton, grains, rice and sugar production

△ **Horticulture & Viticulture**

Fruit, vegetable, tree crop and grape production in temperate and tropical Australia

△ **Mixed farming & other farming ventures**

THE ADOPTION CHALLENGE

In an effort to harness these technologies and capture their benefits throughout the value chain, industry and publically-funded R&D continues to increase, with so far limited impact in terms of widespread adoption or practice-change. Despite the general optimism regarding the potential benefits afforded by agricultural technologies and practices, their adoption has been relatively slow. A lack of integration, usability, and proven return on investment are commonly cited as key market barriers by many producers.

Unlocking this potential will therefore require concerted collaboration between industry, the scientific community and extension services to ensure R&D outcomes are delivered with clear and achievable adoption pathways for farmers.

In combining industry and world-class research capabilities, Australia can develop ground-breaking cross sector innovations in areas such as remote farm management, robotics, autonomous systems, business management as well as drought and risk management. To do this, a truly collaborative and industry-driven R&D initiative is needed to deliver solutions that are specifically suited to the Australian farming context.

Putting the farming sector at the centre of the innovation process is the most effective way of unlocking consumer demand for agricultural technologies into the future.

Unlocking this potential will require concerted collaboration between industry, the scientific community and extension services to ensure R&D outcomes are delivered with clear and achievable adoption pathways for farmers.

FARMING SMARTER CRC

The Farming Smarter Cooperative Research Centre (CRC) will deliver technology and practice-based farming solutions that drive productivity growth throughout the Australian agricultural sector.

By placing the needs of the farm sector at the centre of its strategic direction, the CRC will bring together stakeholders from all facets of the sector to lead a joint research, commercialisation and technology adoption program in agricultural systems.

Industry-driven R&D priorities

Investment partners will work with the CRC board to establish its overall research strategy and determine what problem-based R&D programs will be addressed. At this stage, three key strategic research themes are proposed for consideration.

△ **Monitoring and Control of Production**

- Precision control of greenhouse horticulture production and intensive livestock production
- Optimising the application of farm inputs such as water, nutrients and chemicals;
- Growth of pastures, crops and animals at both the broadacre and individual level;
- Spread of pests and diseases; and
- Environmental and social impacts of agricultural production.

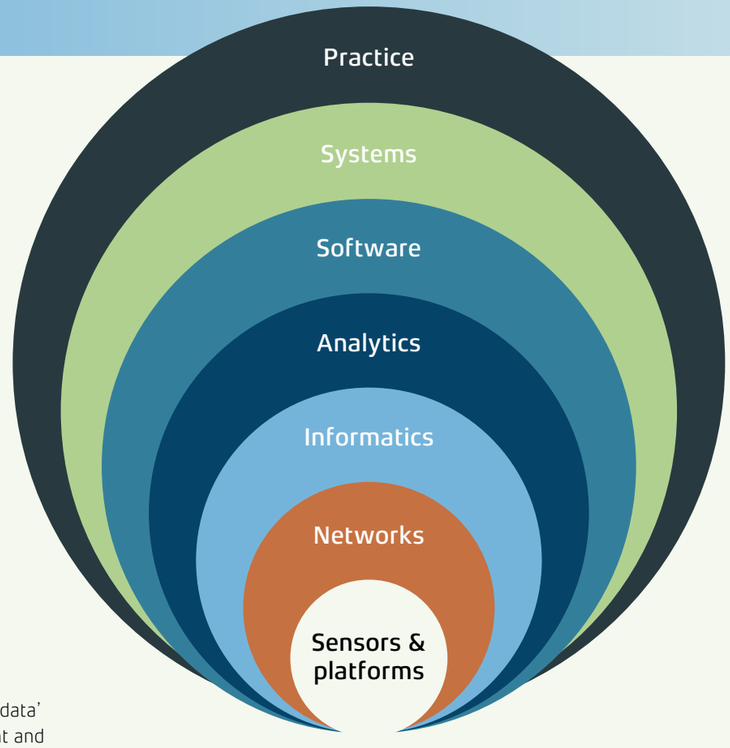
△ **Reducing Business Risks**

- Real-time analysis of business performance by linking on-farm production and financial management systems;
- Accessing emergent high-value markets by capturing evidence of social and environmental compliance and integrating this data throughout the value chain;
- Minimising the effects of climate variability on production;
- Increasing labour productivity and efficiencies through the use of autonomous systems and fit for purpose tools and technologies; and
- Supporting farming technology procurement and adoption by validating return on investment;

△ **Building Farm Sector Capability**

- Build Communities of Innovation and Practice as places for sharing expertise, connecting the farm sector with research and industry, and demonstrating the value of good technology and practice;
- Develop education and training packages for the farm sector that address priority skill sets;
- Deliver degree and higher degree by research programs to develop the agricultural scientists and entrepreneurs of the future; and
- Implement standards to ensure farm sector tool and systems interoperability.

R&D capability profile

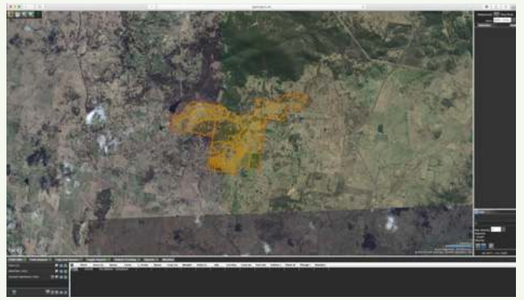


△ **Sensors, platforms and networks** underpin the collection and flow of data across the agricultural enterprise. Technologies including sensors, robotics, drones and communications networks will be developed to provide seamless integration into on-farm decision-support, autonomous monitoring and control applications.

△ **Informatics** provide solutions to 'big data' issues including storage, management and utilisation. New techniques for fusing, analysing and representing data will be brought to bear. Solving these issues will increase data capture and utilisation throughout the value chain.

△ **Analytics** to discover new understandings, patterns and interactions of multi layer complex data sets that will provide new algorithms and tools to support decision making.

△ **Software** needs to provide simple functionality to assist users in managing complex operating environments. On-farm decision-makers also require 24/7 connectedness and user support. Delivering multi-channel access to these tools via the Internet, wireless networks and mobile devices will require innovative user interface design coupled with expertise in Human Computer Interaction.



△ **Systems** thinking will bring together the sensors and platforms, informatics, tools and user requirements. This will require a deep understanding of new information paradigms and how these are to be adopted within an on-farm context. Reducing social barriers to adoption such as privacy, low-ROI and regulatory constraints must be addressed alongside the technological advancements if a competitive and sustainable PA market is to emerge.

△ **Practice** change research, training and education packages will feature as a fundamental function of the Farming Smarter CRC. In addition to an industry-focused PhD program, outreach and adoption techniques will be developed to support the transition of farm enterprises to new endeavours, while at the same time maximising productivity.

INVESTMENT BENEFITS

Participating in collaborative R&D initiatives presents a number of business development opportunities for partnering organisations, including:

- Increased R&D capability through collaboration and public investment
- Access to high-value intellectual property and commercialisation opportunities
- Potential eligibility for the Australian R&D taxation incentive scheme
- Access to on-farm testing and product evaluation facilities
- Collaboration with Australia's world-class researchers in areas such as robotics, sensors, genetics and engineering
- Access to a cross-sectoral and cross-commodity R&D network
- Industry engagement opportunities and social licence to operate
- Increased adoption of PA technologies

Potential Partners

- Technology and telecommunication providers and start-ups
- Farming businesses and advocacy groups
- Production consultants and agents
- Seed, chemical and fertiliser suppliers
- Financial service providers
- Machinery sales and service providers
- Government services and regulatory agencies
- Public research organisations
- Training, education and extension services
- Financial consultancy services
- Large agriculture enterprises, including broad acre, dairy, animal and horticulture
- Small niche farmers
- Agriculture equipment manufacturers
- Farm service providers
- Defence and mining equipment suppliers who may wish to broaden their markets into agriculture

CO-INVESTMENT PROPOSAL

The proposed Farming Smarter CRC will constitute a seven-year, public-private R&D venture. At its core, the CRC will comprise a commercialisation arm, as well as a training and extension arm, which includes an industry-focused PhD program.

The CRC's resource profile will include monetary and in-kind commitments made by partner organisations. The total value of these commitments will determine the amount of public co-investment that can be applied for in the form of a Commonwealth CRC grant.
A minimum of 50 per cent of the overall resource profile must be raised through participant contributions.

Broadly, there are two main ways to get involved in the CRC. These includes becoming either a core or supporting participant . Investment agreements will be developed to encourage flexibility to ensure the CRC's business model can meet the objectives and circumstances of its partner institutions.

Core participants

Monetary or substantial in-kind investments will be integral to the establishment and direction of the CRC. Core participants have an opportunity to shape key aspects of the CRC's research direction and business model, including the Centre's:

- Legal and fiscal structure
- Governance and operational structure
- R&D strategy and key milestones
- Intellectual property and commercialisation agreements

Supporting participants

Partner organisations can also participate in the CRC in a more limited capacity. For example, monetary and/or in-kind contributions can be made on a per-project basis. Flexible terms can be tailored to suit particular business requirements and situations.

▶ The executive board will provide independent oversight of the CRC's performance and activities. The Chair and the CEO will work with the Core Participants to put in place a skills based board that provides the experience and diversity to ensure the success of the CRC.

Chair of the Board Subject to appointment

Interim CEO Associate Professor David Miron

Director of Strategic Research Initiatives, University of New England

Associate Professor Miron has held senior management positions within research organisations and the IT industry. He has extensive experience in diverse areas of on farm technology development, software application development, software design, distributed systems, telecommunications, RFID technology, mobile application development and the modelling of emerging disease threats in livestock. Associate Professor Miron has considerable project, contract and relationship management experience with particular interests in new and emerging technologies and in driving collaboration.

Key Milestones

	Request for UM Participant Declaration / Term sheet to MI	Draft Application	Stage 1 - EOI	Stage 2 - Full application	Outcomes Announced	Funding From
Round 19	As soon as circulated by CRC bid team	As soon as circulated by CRC bid team	Closes July 2017	Closes March 2018	March 2018	July 2018

Becoming a partner

The competitive funding application for the Farming Smarter CRC will be submitted to the Department of Industry, Innovation and Science in early 2017. To register your interest in participating in the CRC bid, please contact:

Associate Professor David Miron

email: dmiron@une.edu.au • Phone: +61 (0) 2 6773 2117 • Mobile: +61 (0) 400 616 540

About this proposal

This proposal was developed by the Research and Innovation Network for Precision Agriculture Systems (RINPAS). The network consists of seventeen research organisations, Rural R&D Corporations and industry groups committed to increasing on-farm profitability and trade opportunities through the development of innovative and fit-for-purpose agricultural technologies and practices.

For more information, visit **rinpas.org.au**

Commercial Expressions of Interest for Participation

Key Milestones

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