



 **FARMING**<sup>CRC</sup>  
**SMARTER**



BUILDING A MORE RESILIENT  
FARMING SECTOR

**#FARMINGSMARTER**



**“FARMERS TODAY NOT ONLY HAVE TO BE EXPERTS ON PLANTS AND ANIMALS, THEY MUST ALSO BE COMPUTER LITERATE, MECHANICALLY INCLINED, SAVVY IN BUSINESS, LEGAL MINDED, AND KNOWLEDGEABLE ABOUT WORLD EVENTS. THEY MUST ALSO BE POLITICALLY ASTUTE BECAUSE MUCH OF THEIR FARM INCOME AND OPERATIONS ARE TIED TO GOVERNMENTAL POLICIES AND REGULATIONS.”**

Arlene Dohm, Occupational Outlook Quarterly

VISION OF SUCCESS FOR A FARMING SMARTER CRC	7
BUILDING A MORE RESILIENT FARMING SECTOR	10
RESEARCH PROGRAMS AND OUTCOMES	13
ADOPTABLE SOLUTIONS IN THE DIGITAL AGE	17
DELIVERING TECHNOLOGY-BASED OUTPUTS	19
JOIN THE FARMING SMARTER CRC	20
WHO CAN BECOME A PARTNER?	22
HOW YOU WILL BENEFIT AS A PARTNER	23
GOVERNANCE	25
INTELLECTUAL PROPERTY	26





## VISION OF SUCCESS FOR A FARMING SMARTER CRC

IT IS VITAL THAT AUSTRALIA’S AGRICULTURE INDUSTRY REMAINS RESPONSIVE AND RESILIENT TO TACKLE THE CURRENT CHALLENGES THAT THREATEN TO LIMIT ITS GLOBAL COMPETITIVENESS IN BOTH FOOD AND FIBRE.

In a period of rapid change, a myriad of solutions is being developed at an increasing rate throughout the agricultural industry. This leaves producers with complex options and considerable investment risk. It is therefore vital that our agricultural industry and farmers can assess and apply the best of these new solutions, so that production and profitability can be boosted in a sustainable manner.

At present, there is no coordinated program dedicated to the rapid development and adoption of technology-based solutions for Australian agriculture. The Farming Smarter CRC will meet this need through a national integration of R&D that responds to the priorities identified by the industry and provides solutions appropriate to Australian farmers.







THE FARMING SMARTER CRC WILL BE A TEN-YEAR, PUBLIC-PRIVATE R&D VENTURE, RESOURCED THROUGH MONETARY AND IN-KIND COMMITMENTS FROM PARTNER ORGANISATIONS. THE TOTAL OF THIS INVESTMENT WILL DETERMINE THE LEVEL OF PUBLIC CO-INVESTMENT THAT CAN BE APPLIED FOR IN THE FORM OF A COMMONWEALTH COOPERATIVE RESEARCH CENTRES (CRC) PROGRAMME GRANT. A MINIMUM 50% OF THE OVERALL RESOURCE PROFILE MUST BE RAISED THROUGH PARTNER CONTRIBUTIONS.



**FARMING SMARTER HAS THE CAPACITY TO BOOST THE AGRICULTURAL SECTOR'S MULTI-FACTOR PRODUCTIVITY TO 4% P.A. FOR 20 YEARS**

**THE FARMING SMARTER GOAL IS TO DRIVE AGRICULTURAL SECTOR PRODUCTIVITY GROWTH TO 4% PER ANNUM FOR 20 YEARS, BENEFITTING AREAS SUCH AS:**

- + Intensive and extensive livestock production, including poultry, dairy, beef, pork and sheep.
- + Broadacre cropping, including cotton, grains, rice and sugar.
- + Horticulture and viticulture, including fruit, vegetable, tree crop and grape.
- + Agroforestry, hydroponics and aquaculture.



**FARMERS**



# BUILDING A MORE RESILIENT FARMING SECTOR

FARMING SMARTER FOCUSES ON CROSS-SECTOR ON-FARM ISSUES TO DRIVE PRODUCTIVITY THROUGH SOLUTIONS THAT UTILISE TECHNOLOGIES OF THE DIGITAL AGE.

Australia’s agricultural industry benefits from proximity to high-growth export markets in Asia, and possesses a solid reputation for food quality and safety. These are significant advantages, but they can only be realised if our on-farm productivity growth keeps pace with that of our global competitors, while addressing production, business, environmental and social constraints.

It is no longer sufficient to respond to these conditions on an individual basis. Navigating the challenges will require resilience: strength, flexibility and responsiveness to change, with clear development objectives embedded in a multi-disciplinary, cross-sector regime.

The Farming Smarter CRC will focus on the farm, taking a farm systems approach to rigorously address these issues, enabling our primary industries to make the next step change in agricultural production, while positioning Australia as an international leader in farm production innovation.

“AGRICULTURE IS PREDICTED TO BECOME AUSTRALIA’S NEXT \$100BN INDUSTRY BY 2030.”

Andrew Robb, Federal Minister for Trade and Investment (2013-2016)

Farming Smarter will develop cross-sector solutions to benefit farmers in production management, business management, and risk management. Stakeholders may include customers, financiers, investors, insurers, capital equipment companies, consumables companies, researchers and governments. This will be achieved against Australia’s backdrop of rising costs and falling commodity prices in relative terms, labour shortages, increasingly complex social and regulatory compliance, ageing farmer populations, unforgiving landscapes, and climate change.

As a collaborative venture, the CRC will bring agriculture’s end users into close contact with world class research capabilities of industry and science to produce leading edge technical, environmental and practice-related solutions that integrate effectively in a defined operational framework.





# RESEARCH PROGRAMS AND OUTCOMES

FARMING SMARTER’S R&D PRIORITIES ARE TO ADDRESS CHALLENGES WITHIN KEY AREAS OF AGRICULTURAL SECTOR PRACTICE, PRODUCING RESPONSIVE INTEGRATED SOLUTIONS THAT FULLY SUPPORT THE END-USER.

In a process of co-creation, our Farming Smarter partners from research, agriculture and industry will work closely with the CRC board to establish an overall research strategy and prioritise problem-based R&D programmes. The Farming Smarter CRC will drive initiatives to research and develop solutions within a framework designed to build farming sector resilience across the following integrated research programmes.

## MANAGING INFIELD VARIABILITY

### Target areas:

Improved spatial and temporal management of production inputs such as fertiliser, water, chemicals and labour on pastures, livestock and crops.

### Outcomes:

- Solutions that seamlessly capture localisation of livestock and crops, providing real-time optimisation of landscape and pastures, plus crops and livestock health and performance.
- Solutions that integrate infield variability with production yield and inputs for the purposes of real-time and post-analysis performance to assist in planning farm activities.
- Automated systems that optimise the use of farm inputs throughout the production lifecycle and seamlessly integrate with the farming system.
- The next generation of Precision Agriculture systems that integrate seamlessly with the farmer and the farming system, while embracing simplicity, functionality and serviceability in enhancing on-farm operations.

## OPTIMISED FARM OPERATIONS

### Target areas:

On-farm connectivity, labour efficiency, energy efficiency, waste management, machinery and system interoperability, reduction of on-farm risks, animal welfare, landscape enhancement, and climate.

### Outcomes:

- On-farm wireless networks for the efficient communication of on-farm data.
- New techniques and technologies that provide resilient, low cost, independent on-farm energy sources, and enhance waste management.
- Automated systems that optimise the use of farm inputs such as labour, capital and infrastructure, and seamlessly integrate with the farming system for planning and performance of farm activities.
- Solutions that provide farm performance analytics and forecasting capabilities for the purposes of optimising future farm-wide operations, including benchmarking, environmental performance and financial performance, while enabling social compliance and communication of the food and fibre production story.
- On-farm solutions that reduce insurance risks through tools that monitor OH&S.
- Solutions that provide early warning and management of multiple land-use impacts, biosecurity events, and climate related events.



LEGAL AND INSTITUTIONAL BARRIERS

Target areas:

Technology for governance integrity, legal frameworks for agriculture data, responsibility chains, aiding innovation, red tape, legal and institutional barriers and complexities that affect agricultural innovation.

Outcomes:

- + Reduced complexity around issues involving intellectual property, international free trade, commercial contracts, and other regulatory areas.
- + New and more cost-efficient approaches that utilise technology for governance with ensured integrity.
- + Greater harmonisation of data capture, recording, reporting and sharing, with integrity safeguards, to deliver competitive advantages.
- + New legal frameworks for optimising value from agricultural data.
- + More efficient and effective approaches to regulatory approval for agricultural innovations, with improved access to Australian and international markets.
- + Greater integrity in agricultural systems and reduced complexity of legal and bureaucratic challenges, enabled through technology and new governance arrangements.
- + Translation of demonstrable integrity and high calibre stewardship into international 'social license' advantages.

BUILDING HUMAN CAPABILITY

Target areas:

Education and training for multi-generational farmers, advisors/consultants, and farm service providers, and social networks and adoption.

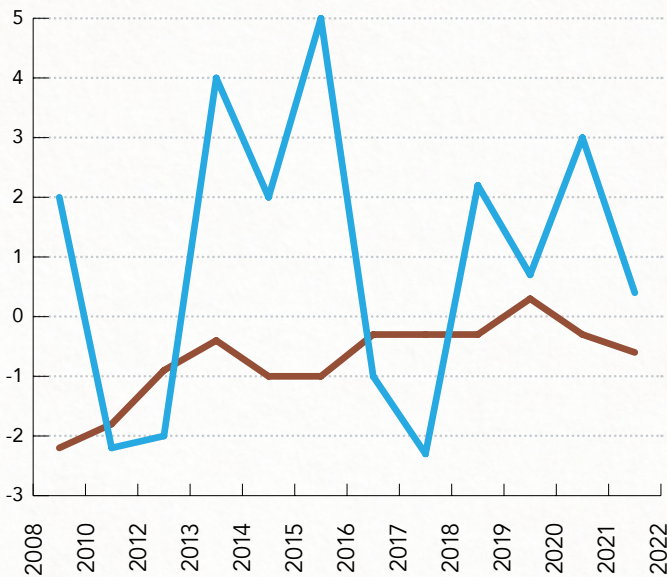
Outcomes:

- + The development of a nationally integrated and accredited education and training scheme for the agriculture and AgTech sectors that includes Universities, the Vocational Education and Training sector, and Registered Training Organisations, to provide higher degrees, diplomas, certificates and short courses that grow the digital capability of the agriculture sector.
- + New approaches to knowledge transfer and dissemination.
- + A skilled future farm sector workforce.

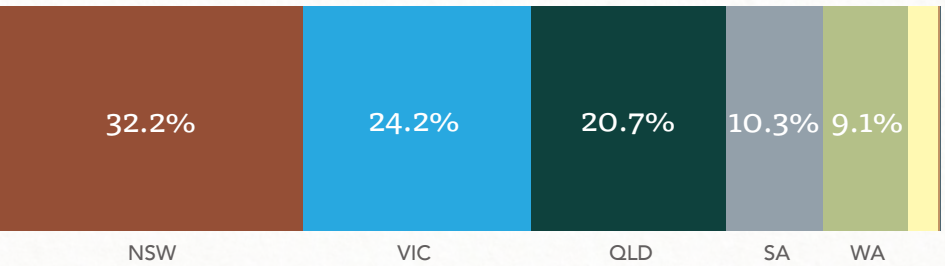
AGRIBUSINESS IN 2015-16 / KEY STATS



Revenue v employment growth (%)



Farms (%)



Source: ibisworld.com.au / Financial Review, 17 Feb 2016



# ADOPTABLE SOLUTIONS IN THE DIGITAL AGE

ONLY BY PLACING THE FARMING SECTOR AT THE HEART OF THE INNOVATION PROCESS CAN WE EFFECTIVELY UNLOCK ITS PRODUCTIVITY POTENTIAL.

The current pace of technological development, advance and obsolescence means that behind the farm gate, the farmer faces complex decisions accompanied by unprecedented investment risk. To ameliorate this, Farming Smarter programmes will have a solid, on-farm research foundation, ensuring that outputs represent a genuine response to an identified need and are truly ‘fit-for-purpose’.

Farming Smarter programmes will produce outcomes with effective cross-sector pathways to adoption. Each project will involve the farmer and farming groups at every stage, so that R&D adheres to a highly responsive protocol. A multilateral facilitated learning process between farmers, farm advisors, industry partners and service providers, coupled with agile project methodologies and an inbuilt incubator approach, will ensure that every solution is rigorously subjected to on-farm situational testing at every stage of its design, development and deployment.

This ongoing process of iteration, from inception to launch and beyond, will heighten the commercial viability of Farming Smarter solutions in domestic markets. With R&D firmly integrated with regionally applicable adoption pathways and value propositions, effective routes will be designed that can then be replicated in diverse overseas markets.



“ALTHOUGH THE WORK ETHIC, PRIDE, AND FOCUS ON FAMILY HASN’T CHANGED MUCH, THE TOOLS WE FARMERS USE HAVE CHANGED A LOT OVER THE GENERATIONS... WE STILL GET DIRTY, WORK LONG HOURS, AND HOPE FOR GOOD WEATHER, BUT NOW WE ALSO THINK ABOUT OUR NEXT SMARTPHONE PURCHASE OR IF A FULLY AUTONOMOUS TRACTOR MIGHT BE A FUTURE INVESTMENT.”

Brian Scott, Farmer, Forbes, 2 Feb 2016



## DELIVERING TECHNOLOGY-BASED OUTPUTS

WHETHER A SOLUTION IS A TECHNOLOGY-BASED APPROACH OR SERVICE, OR A STANDALONE OR CONNECTED TECHNOLOGICAL PRODUCT, IT IS VITAL THAT IT PRESENTS THE END USER WITH A MINIMAL INVESTMENT RISK.

The Farming Smarter CRC is solutions focused. Farming Smarter solutions may include technology, tools, systems, services, systems integration, data capture, or AgTech products and engineering, coupled with management approaches, new practices or protocols. Outputs may bring digital technologies onto the farm, or utilise digital technologies in new business processes or data analysis.

It is vital that all outputs utilise open standards and platforms for data, communications protocols and software, thereby reducing the entry and ongoing cost for service providers to implement solutions on a broader scale.

Firm criteria will be applied during the development of all Farming Smarter projects to ensure that the solutions will:

- ⊕ Interface with existing and emerging agriculture systems,
- ⊕ Integrate seamlessly across existing platforms,
- ⊕ Link on-farm information with business platforms to support evidence-based financial management, and
- ⊕ Adhere to a framework of rigorous standards for integration and compatibility.

**“TO GET THERE, STARTUPS WILL HAVE TO GET THEIR HANDS DIRTY – LITERALLY. AGTECH SOLUTIONS ARE DISPERSED, EXPOSED TO THE HARSH AUSTRALIAN ELEMENTS, JOSTLED AND TRAMPLED BY CATTLE.”**

Alex McCauley, Financial Review, 7 Sept 2016



# JOIN THE FARMING SMARTER CRC

## THE PROPOSED FARMING SMARTER CRC WILL ADDRESS MAJOR CHALLENGES IN AUSTRALIAN AGRICULTURE.

Through effective collaboration, we can deliver a research, commercialisation and adoption program that meets the increasingly complex demands of the burgeoning agricultural sector.

We are keen to engage partners who can make a financial and/or in-kind commitment to Farming Smarter. Financial investments can be ‘untied’ for flexible use in supporting projects, or ‘tied’, to support a specific project.

The CRC’s in-built flexibility means you can become a partner in two ways:

- ⊕ As a Core Partner, you will be involved in shaping aspects of the CRC’s direction and business model, including its legal, fiscal, governance and operational structure; R&D strategy and milestones; and intellectual property and commercialisation agreements.
- ⊕ As a Supporting Partner, you will be involved on a more flexible basis – for example, you might invest on a per-project basis. We can set up an agreement that meets our respective business objectives and priorities.

“NOW MORE THAN EVER, SCIENTISTS, ENGINEERS, FARMERS AND ENVIRONMENTALISTS NEED TO CLOSE RANKS TO TAKE A SERIOUS LOOK AT HOW TO ADDRESS THE PRODUCTION END OF OUR FOOD SYSTEM WITH NEW AND INTEGRATED KNOWLEDGE.”

Robyn Metcalfe, AgTech , 6 Oct 2015





# WHO CAN BECOME A PARTNER?

We are inviting industry stakeholders from farming, industry and research to become partner organisations. By doing so, you will gain the opportunity to drive and deliver innovation, while securing your organisation's involvement in our agricultural industry's future.

Whether you are from farming, the wider agriculture industry, technology, finance, or education and training, partnering with Farming Smarter provides you with numerous R&D and business opportunities.

Becoming a partner represents an extremely cost-effective way to participate in and benefit from large scale research projects and innovative solutions. You will also gain access to high-value intellectual property and commercialisation opportunities.

<b>AGRICULTURE</b> <ul style="list-style-type: none"><li>+ Farming businesses and advocacy groups</li><li>+ Agriculture enterprises</li><li>+ Small niche farmers</li><li>+ Farm advisors and consultants</li></ul>	<b>AG SERVICES AND SUPPLIERS</b> <ul style="list-style-type: none"><li>+ Seed, chemical and fertiliser suppliers</li><li>+ Production consultants and agents</li><li>+ Machinery sales and service providers</li><li>+ Farm service providers</li></ul>
<b>TECHNOLOGY</b> <ul style="list-style-type: none"><li>+ Technology and telecommunication providers</li><li>+ Technology start-ups</li><li>+ Defence and mining equipment suppliers seeking to broaden markets</li></ul>	<b>PUBLIC ORGANISATIONS</b> <ul style="list-style-type: none"><li>+ Government services</li><li>+ Regulatory agencies</li><li>+ Public research organisations</li></ul>
<b>FINANCIAL</b> <ul style="list-style-type: none"><li>+ Financial service providers</li><li>+ Financial consultancy services</li></ul>	<b>EDUCATION AND TRAINING SECTOR</b> <ul style="list-style-type: none"><li>+ Universities</li><li>+ Training, education and extension services</li></ul>

# HOW YOU WILL BENEFIT AS A PARTNER

## INVOLVEMENT WITH LEADING RESEARCH

Partnering with Farming Smarter will give you insider access to research involving farmers, farm service providers and solutions driven companies, bringing you valuable insight into innovative industry perspectives. This will create unrivalled research opportunities, allowing you to enjoy the reputational and commercial benefits that accompany the implementation of world-class research outcomes.

## THE AG SOLUTIONS EDGE

You will gain a comprehensive understanding of the sector's leading edge R&D and the latest national and international developments, increasing your prospects for deployment of these and future solutions. Access to on-farm testing and product evaluation facilities will lead to increased adoption of the farm innovation you are involved with. In fact, joint ventures benefit all the partners' bottom lines by fostering innovative services and solutions for the whole sector.

## A COLLABORATIVE APPROACH

You will have collaborative access to a cross-sector and cross-commodity R&D network, including Australia's world-class researchers, in areas such as robotics, sensors, and engineering. You can build lasting productive relationships with key players in industry and research institutions.

## ONGOING BUSINESS GAINS

As a partner, you stand to increase your R&D capability through collaboration and public investment – you may also be eligible for the Australian R&D taxation incentive scheme. Having the opportunity to help select research projects with adoptable outputs will enable you to build your business's profitability, productivity and competitiveness.

Exposure to excellent training and professional development opportunities will facilitate the faster, more effective adoption of new processes, technologies and management practices in your business.





# GOVERNANCE

THE PROPOSED FARMING SMARTER CRC WILL CONSTITUTE A TEN-YEAR, PUBLIC-PRIVATE R&D VENTURE. THE CRC BOARD WILL, UNDER THE DIRECTION OF AN INDEPENDENT CHAIR, PROVIDE OVERSIGHT OF THE CEO’S PERFORMANCE IN MANAGING THE CRC AND ITS ACTIVITIES.

The board will be skills-based, providing the experience and diversity necessary for the proper functioning of the CRC. Members will be representatives from the various agriculture sectors, such as farmers, grower groups, service providers, consultancy and farming systems.



## CHAIR OF THE BOARD

### John Chapman

John Chapman is a Senior Consultant and Adjunct Professor at the University of the Sunshine Coast. He has consultancies in Australia and the Pacific and consults to the firm Nexus Strategum. John stepped down as Executive Director (ED) Agri-Science in the Queensland Department of Agriculture and Fisheries (DAF) in 2015. Prior to the ED role, he was General Manager of Horticulture and Forestry Science in DAF, following a lengthy career in horticulture research and administration. With board level experience in CRCs and the private sector, he is currently Chair of the Queensland Alliance for Agriculture and Food Innovation at the University of Queensland.



## INTERIM CEO

### David Miron

Associate Professor Miron is Director of Strategic Research Initiatives, University of New England, and has previously 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 interest in new and emerging technologies, and in driving collaboration.



## INTELLECTUAL PROPERTY



The CRC's projects and outcomes will tightly align with industry needs and will have a strong focus on adoption and commercialisation opportunities. To ensure that the CRC meets these objectives requires careful management of intellectual property (IP) brought to or created by the CRC.

Where necessary, commercial sensitivities will be protected through the use of Non-Disclosure Agreements. The CRC will be the sole legal owner of IP generated from its projects, subject to the equity of participants. To ensure swift deployment of new IP, all project participant background IP will be licensed in before project commencement.

If a proposed project is recognised as having strong commercialisation potential, IP created during the project will vest in a proprietary limited company established as a special purpose vehicle. All other new IP or knowledge will be confidentially transferred to CRC participants for immediate adoption or, if appropriate, published.





