
The Parliament of the Commonwealth of Australia

Smart farming

Inquiry into agricultural innovation

**House of Representatives
Standing Committee on Agriculture and Industry**

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Foreword

Australia has always been a world leader in agricultural innovation. Our farmers, supported by researchers, industry groups and other stakeholders, remain at the global forefront of the invention and adoption of technologies. This enthusiasm for change and innovation has helped Australian agriculture to retain its competitive edge over other producers.

Technological advances will be even more important to the future of Australian agriculture. The sector is a part of the broader boom in innovation across the Australian economy. Meanwhile, new technologies will support farm businesses to tackle heightened regional competition, growing resource scarcity, and other challenges.

The agriculture sector must be able to make the most of the innovation boom in order to support productivity growth and to maintain its competitiveness. At the core of the agricultural innovation boom are individual farm businesses that make decisions to adopt new technologies. If the Government wishes to support innovation and growth, it must support these businesses in technology adoption.

In this light, the Committee agreed to conduct an inquiry into emerging agricultural technologies, key barriers to their adoption, and what the Government may do to remove or reduce these barriers.

The Committee was pleased to hear of the vast scope and potential of emerging technologies in agriculture. These technologies will be different from those that have come before. They will perform ever more complex and varied tasks; they will collect and share greater volumes of data; and they will be more integrated across farms and along supply chains.

It became clear that these complex new technologies will bring their own challenges to farm businesses seeking to adopt them. Some of these barriers to successful adoption stem from the demands on internet, cloud and other physical infrastructure. In other cases, some regulations may unfairly impede the use of new technologies.

Another difficult set of barriers to adoption arise from the demand for more people with more advanced skills to shepherd technologies through the

innovation system and into the hands of the end user. There needs to be more collaboration between the organisations in the R&D process. There also needs to be a surge in the skilled researchers and workers supporting the sector.

The Government has already taken strong steps to support innovators in tackling the agriculture sector's challenges, such as through the ongoing rollout of the National Broadband Network.

In other cases, the Committee's recommendations have supported the tailoring of existing programs to the needs of the sector as it undergoes technological transformation. Regulation of technologies like unmanned aerial vehicles, and strategies in areas such as STEM education, may be helpfully adjusted to improve the capabilities of the agriculture sector to adopt new technologies.

These recommendations of the Committee have focussed on ensuring that the Government is responsive to the needs of farm businesses seeking to adopt innovation. The Committee has also recommended ways to support other players in the agricultural innovation system to do the same, for example through continued use of the successful Cooperative Research Centre program.

The Committee would like to express its appreciation to all who have contributed their valuable time and wisdom throughout the course of the inquiry.

Rowan Ramsey MP
Chair



Membership of the Committee

Chair Mr Rowan Ramsey MP

Deputy Chair Ms Clare O'Neil MP

Members

The Hon. Joel Fitzgibbon MP	Ms Melissa Price MP
Ms Michelle Landry MP	Mr Dan Tehan MP (to 11/2/2016)
Ms Nola Marino MP (from 11/2/2016)	Mr Rick Wilson MP
Ms Cathy McGowan AO MP	Mr Tony Zappia MP
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Terms of reference

The Committee will inquire into and report on the role of technology in increasing agricultural productivity in Australia. The inquiry will have particular regard to:

- improvements in the efficiency of agricultural practices due to new technology, and the scope for further improvements;
- emerging technology relevant to the agricultural sector, in areas including but not limited to telecommunications, remote monitoring and drones, plant genomics, and agricultural chemicals; and
- barriers to the adoption of emerging technology.



List of abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACFR	Australian Centre for Field Robotics
ACOLA	Australian Council of Learned Academies
ADF-DA	Australian Dairy Farmers and Dairy Australia
AIA	Ag Institute Australia
ATSE	Australian Academy of Technological Sciences and Engineering
APVMA	Australian Pesticides and Veterinary Medicines Authority
AusBiotech	Australia's Biotechnology Organisation
AWiA	Australian Women in Agriculture
CASA	Civil Aviation Safety Authority
CBA	Cotton Breeding Australia
CC-SC-ALFA	Cattle Council, Sheepmeat Council and Australian Lot Feeders Association
CRC	Cooperative Research Centre
CRDC	Cotton Research and Develop Corporation
CSIRO	Commonwealth Scientific and Industrial Research Organisation

DAWR	Department of Agriculture and Water Resources (Cth)
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
GM	genetically modified
GPS	Global Positioning System
GRDC	Grains Research and Development Corporation
GTR	Gene Technology Regulator
NBN	National Broadband Network
NHMRC	National Health and Medical Research Council
NRWC	National Rural Women's Coalition
PBCRC	Plant Biosecurity Cooperative Research Centre
PIRSA	Department of Primary Industries and Regions South Australia
R&D	research and development
RD&E	research, development and extension
RDC	Research and Development Corporation
RFID	Radio frequency identification
RIRDC	Rural Industries Research and Development Corporation
STEM	science, technology, engineering and mathematics
TAFE	Technical And Further Education institutions
TFP	total factor productivity: total output growth relative to the growth in traditionally measured inputs of labour and capital
UAV	unmanned aerial vehicle



List of recommendations

1

Introduction

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Australian agriculture and productivity

3

Emerging technologies in agriculture

4

Telecommunications and data services

Recommendation 1

The Committee recommends that the Commonwealth Scientific and Industrial Research Organisation, in cooperation with industry, undertake a technical study to identify cost-effective approaches to using satellite services as backhaul for local wireless networks for agricultural applications.

Recommendation 2

The Committee recommends that the Australian Government commit to the continuation of the Mobile Black Spot Programme beyond the second round, and that the Department of Communications and the Arts consider changes or additions to the selection criteria to capture the telecommunications requirements of agricultural activity.

Recommendation 3

The Committee recommends that the Australian Government, in consultation with industry stakeholders, investigate incentives for mobile network operators to provide roaming services in rural and remote areas.

Recommendation 4

The Committee recommends that the Department of Agriculture of Water Resources, in conjunction with public and private infrastructure providers, publish consolidated information about the availability of telecommunications services in rural and remote agricultural areas.

Recommendation 5

The Committee recommends that the Council of Rural Research and Development Corporations, in conjunction with research and training providers and producer groups, coordinate the development and delivery of educational resources to raise awareness of innovative applications of telecommunications services across the agricultural industry.

5

Human capital

Recommendation 6

The Committee recommends that the Australian Government ensure that rural women's groups are included in future government-led policy-building activities and inquiries.

Recommendation 7

The Committee recommends that the Australian Government target funding for the development of innovative education strategies for agriculture, within the current science, technology, engineering and mathematics funding program.

Recommendation 8

The Committee recommends that the Australian Government provide assistance and support to farmers' groups to pursue farming benchmarking and support the development of national data sets.

6

A coordinated approach to research and development

Recommendation 9

The Committee recommends that the Department of Agriculture and Water Resources, in conjunction with the Department of Industry, Innovation and Science, investigate establishing appropriate incentives for the greater allocation of resources from rural Research and Development Corporations to relevant Cooperative Research Centres.

Recommendation 10

The Committee recommends that the Australian Research Council review its programs for funding research, with a view to increasing the duration of grants to be at least five years.

Recommendation 11

The Committee recommends that the Australian Government develop a national working group on agricultural innovation, focused on improved functionality of the agrifood/fibre innovation system. This working group should be developed as part of a wider strategy of cross-sectoral agricultural innovation, within the National Primary Industries RD&E Framework.

7

Regulation

Recommendation 12

The Committee recommends that the Department of Agriculture and Water Resources pursue legislative and regulatory changes to enable the Australian Pesticides and Veterinary Medicines Authority to use the decisions of trusted and comparable international regulators as a basis for product registration.

Recommendation 13

The Committee recommends that the Australian Government, through the Council of Australian Governments, pursue reform options to ensure national consistency in the regulation of gene technology.

Recommendation 14

The Committee recommends that the Australian Government commission an independent review of the implementation and effectiveness of the Gene Technology Agreement with particular reference to the impact of moratoria invoked by state and territory governments under the Recognition of Designated Areas Principle.

Recommendation 15

The Committee recommends that the Department of Agriculture and Water Resources, in cooperation with Standards Australia, update the

National Standard for Organic and Bio-Dynamic Produce to introduce a threshold for approved genetically-modified material consistent with comparable international standards.

Recommendation 16

The Committee recommends that the Department of Agriculture and Water Resources and the Civil Aviation Safety Authority develop appropriate extension materials promoting the appropriate use of unmanned aerial vehicles in the Australian agricultural sector.

Recommendation 17

The Committee recommends that the Civil Aviation Safety Authority investigate regulations requiring unmanned aerial vehicles to be flown within visual line of sight, with a view to amending the regulations to enable agricultural producers to use such vehicles for monitoring purposes beyond line of sight on or over their own properties.

Appendix A: List of submissions

Appendix B: List of exhibits

Appendix C: List of public hearings

Appendix D: Examples of advances in technology in Australian agriculture