Australian Government
Rural Industries Research and Development Corporation

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Committee Secretary
House of Representatives Standing Committee on Agriculture and Industry
PO Box 6021
Parliament House
Canberra ACT 2600

Submission to the inquiry into agricultural innovation

The Rural Industries Research and Development Corporation (RIRDC) welcomes the opportunity to make a submission to the House of Representatives Standing Committee on Agriculture and Industry inquiry into agricultural innovation.

In addressing the Inquiry's terms of reference, the submission highlights RIRDC's investment in a range of research, development and extension activities that support Australia's rural industries to continue to be at the forefront of developing and adopting new agricultural technologies.

Should the Committee require further information regarding the submission, please contact me.

Yours sincerely

Craig Burns
Managing Director

Rural Industries Research and Development Corporation
Submission to the
House of Representatives Standing Committee on Agriculture and Industry's
Inquiry into Agricultural Innovation

Agricultural production systems in Australia need to continue to adopt transformative technologies if producers are to adapt to sectoral and cross-sectoral productivity challenges such as climate change and variability, biosecurity, natural resource management, resource and labour competition, transport, infrastructure and capacity building.

Such challenges are not unique to specific industries, regions or even to Australia, but will be required globally if we are to feed the world's rapidly growing population within the sustainability constraints of available land and fresh water.

RIRDC's Role

The Rural Industries Research and Development Corporation (RIRDC) has a unique mandate in Australia's rural research, development and extension (RD&E) system with three key roles:

1. Discovering, incubating and growing new, emerging agricultural industries for Australia.
2. Supporting individual small industries – RIRDC manages research for close to 40 small industries such as rice, pasture seeds, chicken meat and honeybees and supports a number of developing industries/ commodities including native and commercial rice, biofuels (sweet sorghum), crocodile, buffalo, exotic tropical fruits, and indigenous products.
3. Undertaking research of national multi-industry importance across the rural sector. This cross-sectoral role is a unique competency of RIRDC and fills a gap where the research is nationally significant but difficult to link to the priorities of individual industries.

An example of one of RIRDC's programs in the cross sectoral area is the National Rural Issues program which aims to deliver independent, trusted and timely research to inform industry and government leaders who influence the operating environment of Australia's rural industries. Examples of relevant research projects include:

- Horizon scanning for Australian rural industries, to identify trends for the next 20 years and inform strategic investments to ensure long term innovation, profitability and sustainability.
- The international trade agenda, including technical market access and export assistance.
- The competitiveness of Australian agriculture in domestic and international markets.
- Improved access to agricultural and veterinary chemicals for agricultural industries.
- Potential for a domestic food Geographical Indications regime in Australia.
- Studies to understand the current contribution of agriculture in particular regions and identify constraints and opportunities to future competitiveness.

Technology driving agricultural productivity gains

Since the 1960s, agriculture has benefited from increased use of agrochemicals, advances in crop and animal genetics, agricultural mechanisation and improved management practices. These technologies have driven productivity increases and will continue to provide future incremental improvements.

At a workshop of 44 Horizon Scholars[1] held in Armidale in July this year, the university students, many of which are farmers, noted in the workshop communique that new technologies such as variable rate technology, precision agriculture, global positioning systems, auto-steer drive and pest resistance crop varieties are already a reality of modern farming production systems. The group also identified that ongoing technology advancements will continue to play a vital role in the future of global agriculture, and have a vital role to play in feeding the world.

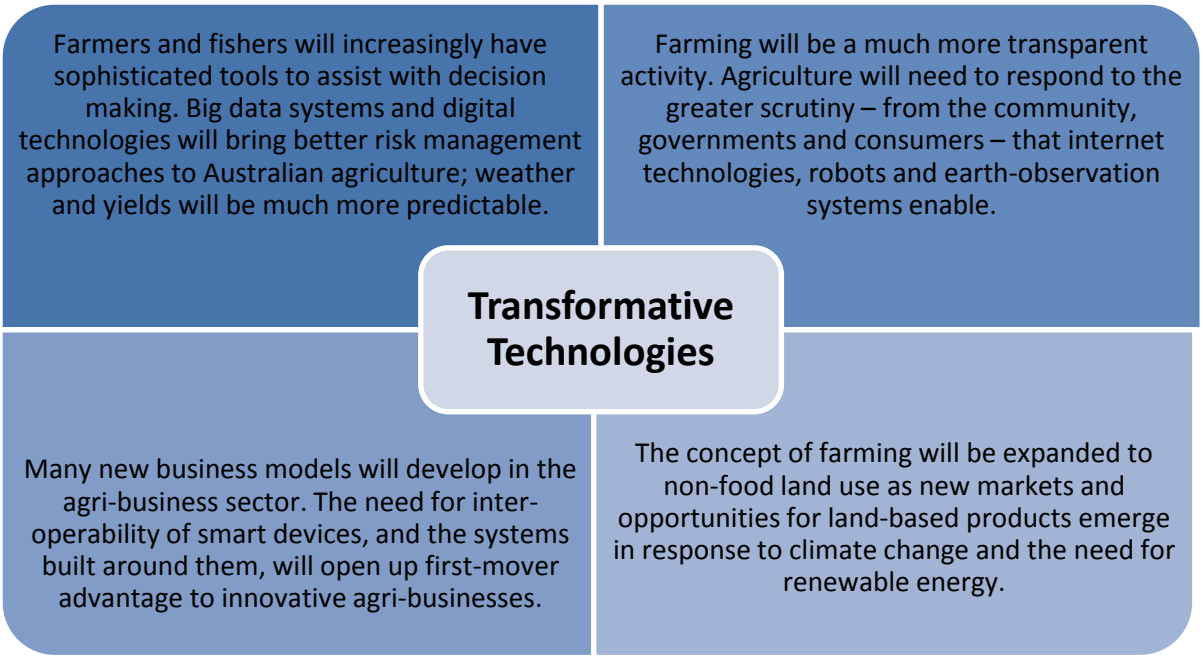
The need for technology to drive advances in agricultural productivity is well-studied and understood by governments, researchers, industry, and importantly farmers. Two key reports recently released that further explain and document the importance and implications of agricultural technological innovation are flagged below and are useful documents in the context of this Inquiry.

Rural Industry Futures

RIRDC recently partnered with CSIRO to develop a report that looked into the megatrends impacting Australian agriculture over the coming twenty years. The report titled *Rural Industry Futures* conducted a strategic foresight exercise on the future of Australian agriculture with the aim to help industries, individuals, companies and governments make informed and strategic choices to secure better outcomes.

The research outlines five megatrends that will impact Australian agriculture in the 15-20 year horizon. Innovation and technology have the potential to create opportunities and challenges across the five megatrends. One of the five megatrends identified was 'Transformative Technologies', which was explained in the report as "advances in digital technology, genetic science and synthetics will change the way food and fibre products are made and transported". The report went on to describe the implications for rural industry innovation of the transformative technologies megatrend. Those being:

[1] Horizon Scholarship is a RIRDC program supporting students from around Australia studying agriculture at university. The program gives students a pathway to a career in agriculture as well as skill development and networking opportunities.



Australia's Agricultural Future

Findings from *Australia's Agricultural Future*[2], a report for the Australian Council of Learned Academies, released in July 2015, presents an important view on the opportunities and barriers for the agricultural sector, including transformative technology for farms of the future. There were a number of key findings from the report that are relevant to the work of this Inquiry and have cross-over with issues that RIRDC is also pursuing. Those relevant findings are:

1. Future agricultural enterprises will rely more on automation, robotics and sophisticated data analysis, causing employment opportunities to shift towards more specialised knowledge, skills and training.
2. The food value chain is increasingly utilising modern information systems.
3. Technological requirements of future farming may drive farmers to specialise in production whereas risk-reduction and sustainability drivers could push some farms to be more diverse.
4. Agriculture and food industries will need access to reliable, real-time information about markets, consumer preferences, and the conditions of the resource base.
5. Profitable agricultural industries will support those farmers and their communities that are innovative and well connected.
6. Contemporary agricultural industries with strong participation in export markets have innovative partnerships between farmers, information providers and researchers and have more farmer-initiated innovation.
7. Agricultural production and marketing are increasingly knowledge-intensive activities, drawing on technological development in computing, engineering and data analysis.

[2] Daly. J et al (2015), Australia's Agricultural Future. Report for the Australian Council of Learned Academies, www.acola.org.au.\

Supporting industries to develop, adopt and adapt new technologies and innovations
RIRDC proactively supports its industries through delivering RD&E outcomes to enable them to be at the forefront of technology and innovation, using it to proactively manage issues and respond to challenges. Of RIRDC's portfolio industries, Australia's rice industry stands out as the world leader in terms of water efficiency and use. This has been brought about through varietal selection but also innovation in water use practices, adapted and adopted by industry. Overall, RIRDC rice research has delivered strong outcomes for industry with a 35% increase in rice yields from 1986 to 2002 and a 60% increase in water productivity.

An example of a RIRDC rice project using new technology to increase the efficiency of water use in the rice industry is the Breeding Program project. RIRDC supports the development of rice varieties that produce more rice with the minimum amount of water. Sherpa was released in 2012 and produces more rice than benchmark varieties. Sherpa has also shown a strong improvement to cold tolerance by 2 degrees C, with high yield potential and mid to short growth duration. This has led to more consistent yields for farmers as well as productivity gains through better and more efficient use of water.

Another RIRDC portfolio industry is the chicken meat industry where levied funds are used for a range of innovative projects. A recent example of a project driving industry-specific improvements in production practices is the Near Infrared Reflectance (NIR) testing for nutritional value of feedstuffs.

The RIRDC Chicken Meat Program has developed indicators and rapid tests for measuring the nutritional value and/or quality of feed ingredients that can be implemented at receival on an individual load basis. The NIR testing has taken the guess work out of feed formulation. Cereal grains vary widely in available energy and protein content, which is then often reflected as variation in bird performance (due to standardized ingredient values being used for ration formulation). NIR technology is leading to more efficient formulation of commercial diets for broiler chickens.

There are many similar examples of innovative projects across the RIRDC portfolio, and moreover the whole RDC system. A further summary of innovative rice and chicken meat industry projects is at Attachment 1. The challenge going forward is how to ensure a policy environment that is as attractive as possible for private sector investment in agriculture, while also maintaining public sector investment, in order to ensure that productivity gains in its production systems do not fall behind competitors.

An area not touched on in this submission is the significant contribution of private sector and international investment in Australia's agricultural R&D system. New technologies, innovations and R&D outcomes often 'spill over' within the same industry, in complementary industries, and even other countries. These spill overs have the potential to drive sizable productivity gains.

A RIRDC report, commissioned in 2014 by the Australian Government Department of Agriculture and Water, as part of its G20 presidency, titled *Improved agricultural productivity through enhanced collaboration and information sharing among G20 countries* (the G20 report), discusses 'better

recognising and exploiting the spill over benefits of R&D outcomes through a more organised approach to the sharing of R&D outcomes which may help deliver greater efficiencies, less repetition and wider uptake of innovation'. Australia has a role to play in facilitating practical mechanisms for greater domestic and international information sharing for the purposes of avoiding duplication.

Translation to adoption

While innovation and technology has the ability to deliver 'game changers' for agricultural industries, the Agricultural Competitiveness White Paper correctly acknowledges that "we need to ensure [innovative agricultural R&D] is getting out of the laboratories and onto the farms".

Specific to the rice industry, a re-structure of the NSW Department of Primary Industries (DPI) and the change in focus of Commonwealth Government funding, rice farmers no longer have access to regional district agronomists and regional coordinators. The 'Rice Industry Extension Coordination Project' aims to address this extension gap and improve the uptake of rice industry best management practices and the adoption of new technologies. It is hoped this project could become a sustainable model for other industry extension and innovation dissemination.
Key attributes of this project are:

1. Effective and timely dissemination of key R&D information for rice-based farming systems that is easy for growers to understand and apply on farm through:
    - published and electronic materials;
    - meetings and discussion groups;
    - on farm demonstrations; and
    - an effective platform for storing and sharing rice R&D information.

2. Effective coordination between relevant public and private sector rice industry providers. An effective network will:
    - avoid duplication of RD&E effort and identify synergies within the rice industry and related commodities;
    - provide a conduit for two-way information flow between growers and researchers to identify emerging issues for rice-based farming systems and better target research investment; and
    - disseminate more holistic information to growers as cost effectively as possible through better integration of retail sector services and partnerships.

3. Assist growers to develop 'systems farming' thinking and make strategic operational decisions, including a better understanding of the positive relationship between production efficiency, enterprise profitability and natural resource management.

The enabling environment

In addition to extension and translation to adoption, the enabling environment must be in place to capitalise on potential productivity gains at the farm gate. This involves having the right infrastructure, systems and regulatory and market operating environment in place. However, some of these enablers are squarely in the domain of governments but others fall outside of the remit of all levels of government.

Big data for example is seen by many as a new frontier of technological innovation. As highlighted in the G20 report, it can be difficult for countries to stay ahead of new technologies. In the case of big data, some countries are more advanced in putting in place the appropriate policy settings and regulations, but for many countries the challenge remains for governments to connect decision makers right across the R&D chain with relevant data in a systematic way.

The Horizon Summit communique summarises the priorities of young rural people in terms of creating an enabling environment conducive to adapting and adopting technological advances in agricultural industries. A key concern they identified was around connectivity and communications, specifically reliable access to phone and internet coverage.

The students saw this as a key inhibitor or barrier to current and future uptake of agricultural technology and recommended "the fast tracking of access to the internet and other technological foundations that are required for Australian farmers to adopt key technologies and best practice production systems".

The National Broadband Network is a key step towards making this a reality; however, the speed of the rollout and the scope of availability within rural, regional and remote communities will impact its long term effectiveness and is a barrier to the adoption of emerging technology in the agricultural sector.

Skills, pathways and capacity building

A key component of delivering RIRDC's vision of 'enhanced prosperity for Australian rural industries and their communities' is its long term investment in people. RIRDC has identified young people and women as key to building diversity within agricultural industries that is necessary for a profitable and sustainable rural Australia. In this submission, we wanted to draw attention to one initiative in particular, the Horizon Scholarship Program, but the comments are equally applicable across other investment streams within RIRDC's Investing in People initiatives.

The Horizon Scholarship Program supports university students studying agriculture or related degrees at Australian universities. The aim of this program is to support the next generation of agricultural leaders who will take up the challenge of farming for the future.

In the context of the Inquiry, this group is particularly relevant as they have grown up using technologies on farms that older generations largely consider to be 'new'. While the same can be said for previous generations, the argument can be made that in a world of increasing input costs, labour and import competition and threats from climate variability and increased chemical

resistance, the reliance on technological advances to deliver productivity gains has never been more important. This is reflected by the fact that each year farmers must increase their productivity by 2 per cent just to stay even.

Horizon Scholars, and young people in general, are important to this conversation as we are not only talking to the current adopters of new technology and innovations but they are also the future adopters. An interesting perspective has been the changing views of young people on where the opportunities for agricultural innovation originates. Previously agricultural innovation has largely come from and been driven by the agricultural sector. The Program has highlighted how multi-disciplined agriculture now is, where occupations such engineers, biochemists and physicists are now playing a critical role in driving agricultural technological innovations.

Young people have a lot to add to the conversation around agricultural innovations which was demonstrated at the Horizon Summit in July. A full copy of the Summit communique is at Attachment 2.

RIRDC RESPONSE TO INQUIRY INTO AGRICULTURAL INNOVATION

Attachment 1 - RIRDC projects driving innovation in the rice industry

Box 1. RIRDC projects driving innovation in the rice industry

RIRDC projects pushing the boundaries of innovation for the Rice industry:

Rice Varieties

Partnership

- The rice breeding program is now geared to breed varieties faster.
- Previous to the breeding partnership, a variety was delivered in 7-9 years.
- 4 years ago a fragrant line was highlighted as a priority need for Australia to be able to participate in the valuable fragrant rice markets and Topaz was released last year (2014) which will translate into valuable returns for rice growers from the Hong Kong market, where Topaz outperformed other fragrant rice varieties for taste, appearance and flavour.

Better water use

- RIRDC supports the development of rice varieties that produce more rice with the minimum amount of water.
- Sherpa was released in 2012 and produces more rice than benchmark varieties.
- Sherpa has improvement in cold tolerance by 2^0C, high yield potential and mid to short growth duration.

Chemical Options

Better use of chemicals

- Thirty one field days were presented in the three years to assist in the dissemination of chemical trial results and to encourage exchange of chemical use experience by growers and agronomists.
- Best herbicide use summaries and demonstration plots are used to deliver important messages for safe use and management of chemicals for the operator and the environment.

Alternative chemicals

- New chemicals that can be used for snail control, herbicide use, and investigations into rice blast have been found and commercialised or are in the process of being commercialised.

Extension and Adoption

- The extension project has come up with a way for the rice industry to maximise the delivery and uptake of research outcomes from both RIRDC funded research as well as private agronomist research.
- It is a focal point of knowledge transfer and a feedback point for issues requiring R&D.

Strategic Research

a. Assessment of degradable polymer film for planting of rice varieties

- Ultrathin, biodegradable plastic films from the Polymer CRC are being assessed in their ability to create a microclimate in the rice field to retain soil moisture and heat.
- The plastic film degrades as the rice plants grow.
- Field trials by the CRC for Polymers in conjunction with the Birchip Cropping Group for Maize have shown consistently high germination rates, good establishment and early

growth in the first 4 to 8 weeks before the film degrades and has led to dramatic increases in yield in corn.
- The degradable film, resulted in significantly higher plant populations and higher germination rates for rice, but this was not translated in a better growth or yield over the crop season.

b. A study of microwave-based weed management in the rice industry

- The research has demonstrated that microwave treatment of in-situ soil, can effectively kill barnyard grass weed plants and their seeds in the top 2 cm of soil.
- Additionally, in replicated pot trials the mean grain yield of wheat, canola and rice was significantly high than the control.
- The microwave treatment also killed nematodes and snails.
- It is becoming evident that microwave soil treatment could be considered more as a benign version of soil fumigation and conditioner than simply as a replacement herbicide.

Box 2. RIRDC projects driving innovation in the chicken meat industry

RIRDC projects pushing the boundaries of innovation for the Chicken Meat industry:

Project example 1: NIR (Near infrared reflectance) testing for nutritional value of feedstuffs

- The RIRDC Chicken Meat Program has developed indicators and rapid tests for measuring the nutritional value and/or quality of feed ingredients that can be implemented at receival on an individual load basis. The Near infrared reflectance (NIR) testing has taken the guess work out of feed formulation. Cereal grains vary widely in available energy and protein content, which is then often reflected as variation in bird performance (due to standardized ingredient values being used for ration formulation). NIR technology is leading to more efficient formulation of commercial diets for broiler chickens.

- The RIRDC Chicken Meat Program has funded a number of projects that have aimed to improve the accuracy and usefulness of NIR calibrations (for the Chicken Meat industry) that were developed under the Premium Grains for Livestock Program administered by GRDC, through collection of data on physical, chemical and nutritive properties of numerous cereal grain samples.

Project example 2: High resolution melt (HRM) assays for detection and typing of avian pathogen

- The RIRDC Chicken Meat program funded the development of a number of HRM assays for poultry pathogens (viruses such as ILTV (Infectious laryngotracheitis virus), bacteria such as Chlamydia) as part of a poultry-industry wide effort to improve pathogen detection, early notification, surveillance and pathogen typing. Prior to the development of these HRM assays, molecular methods took a number of days for results to be prepared, which was often too late to prevent the spread of some pathogens and the harm to the flock.

- HRM is a technology that is not only able to detect the absence or presence of a pathogen, but it can determine the strain of the pathogen at the same time. This has significantly improved the turnaround time for results, reduced the cost of sample analysis and improved industry responses to disease. These HRM assays are now used on a regular basis by poultry veterinarians and industry laboratories to confirm diagnoses or identify issues and have improved the efficiency of poultry production through better control of diseases.

RURAL INDUSTRIES
Research & Development Corporation

the HORIZON scholarship

COMMUNIQUE
2015 Horizon Scholars' Summit

Armidale in New South Wales hosted 44 of Australia's most driven and determined advocates for agriculture as part of the three-day Horizon Scholars' Summit held from 28 June to 1 July 2015.

The Summit provided a unique opportunity for scholars studying agriculture and related degrees from around Australia to network with local industry and academics as well as improve leadership and communication skills. This is the first time the annual summit has been held in a regional area, offering an opportunity to showcase the New England area and its agricultural industries.

The theme of the Summit was 'transformative technologies for agriculture.' This was one of five 'megatrends' likely to shape the future of the agricultural sector over the 15 to 20 year horizon, as identified in a soon to be published report developed through a partnership between RIRDC and the CSIRO.

Transformative technologies such as variable rate technology, global positioning systems, auto-steer drive and pest resistance crop varieties are going to play a vital role in the future of global agriculture, and have a vital role to play in feeding the world.

As young people with a particular interest in, or commitment to, agriculture, we believe we have an important perspective to contribute in this area.

- We often have a different view on the future and how things can be achieved.
- Our experiences with technology is quite different to older generations. The ideas and opportunities that we may be able to visualise are not generally constrained by history and experiences.
- We have a very long term view of what the future success of the industry looks like which provides a unique platform to identify innovative opportunities and ways to improve an industry's performance.

A future of transformative technologies creates opportunities, however the threats from technologies can also create uncertainty. If the agricultural sector is proactive, many new technologies have the potential to be 'game changers', particularly given their strong potential to impact how agriculture is managed, marketed and perceived. On the flip side, if we are static and do not fully consider how to position the industry for future growth, it can create risks. These risks have the potential to significantly impact our ability to keep pace internationally and maintain our competitive advantage as a clean, green producer or quality food and fibre products.

We, as young people aspiring to play a leadership role in the agricultural sector, are in a unique position and urge people to:

1. proactively consider possible technologies that could benefit Australian agriculture and drive technologies that will best position the industry
2. urge the fast tracking of access to the internet and other technological foundations that are required for Australian farmers to adopt key technologies and best practice production systems
3. provide decision support information so farmers, advisors and industry influencers can make effective decisions around which technologies they will use and how they will balance these with their preferences for their businesses and communities
4. attract a wide range of skills, disciplines and experiences to contribute to Australian agriculture, and
5. use technology advancements, such as social media, to present Australian agriculture positively and provide information on achievements and practices of the sector. The sector should also use social media to be responsive to consumers' information needs.

The Scholars presented key insights and ideas from the Summit to industry leaders, staff from the University of New England (UNE), local businesses, media and government representatives from around the New England. These ideas were:

1. Investment in technology to drive a more productive and safer agriculture

We believe that the key to a successful future for Australian agriculture is continued investment by the agricultural sector into world leading technologies and innovations. The benefits of such investments can be realised not just by the owners of the technology but also groups along the supply chain from farmers, processors, wholesaler, and consumers. As an example, consumers may benefit from improved food safety and biosecurity outcomes and greater choice through increased levels of traceability within the food and fibre supply chain. Matching this technology with appropriate regulation around issues like genetic modification (GM) labelling, chemical application and area of origin, disease outbreaks and health concerns mean that any issues that arise can be isolated and dealt with quickly and efficiently.

We also believe that the integration of these investments in technologies allows the production of "more with less", preserving Australia's diminishing resources. If we do not keep up with these changes in technology then someone else will, which may have the undesired effect of driving Australia's much celebrated competitive edge backwards.

2. Internet connectivity – limiting the productivity of Australian agriculture

A lack of reliable access to internet and mobile coverage is one of the most restrictive elements in preventing the wider uptake and adoption of existing and emerging technologies in Australian agriculture. We believe that established agricultural community groups and leadership can play a constructive role by driving the push for greater coverage across rural Australia which is the key to gaining better connectivity. We see that funding and logistics can be overcome through exploring options outside of government rollouts. Long term further investigation of options for improving connectivity needs to be explored, first prioritising the dire need for better and more reliable regional and remote internet and mobile access.

3. Maintain regional culture – by getting technology service our requirements

As young people who are passionate about producing quality food and fibre for the world, we strongly believe that despite the reliance on technology and farming innovations for industry growth, the culture of Australian agriculture and regional communities should not be lost.

Fostering rural communities is key to maintaining the culture of Australian agriculture. While technological advancements will continue to drive much of the change in farming and agribusiness, we believe that there should be a balance between the reliance on technology and the general knowledge and intuition of farmers to ensure that fundamental aspects of farm life are valued and that the longevity of the Australian farming culture is secure. Group collaboration and discussion on the mix of new and existing techniques that are available to maximise production will allow this culture to grow whilst also maintaining technological awareness and being competitive with corporate enterprises.

4. Education and extension are crucial for upskilling rural Australians

As technology continues to become an integral part of 21st century agriculture, the importance of keeping pace with the skills and education needs of our workforce grows. With the proportion of young farmers decreasing by 75% in the last 50 years (Rural Industry Futures), it remains that there is a need to cater for all demographics.

Linking the cross-cutting education and extension needs at the industry level would have a powerful effect in bridging the gap between the "skills developer" and the "skills producer". We see a need for the general increase in upskilling at all occupational levels, from labourers to agribusiness leaders, to not only operate and adopt new technology but also to appreciate the possibilities that they can provide. To make the most of new technologies and increase adoption rates, we believe that this greater collaboration will lead to improved identification of skill development needs across agricultural industries and better and more targeted delivery of these skills.

5. Social media – use to promote agriculture and be responsive to public needs

We believe that social media has the ability to continue to raise the profile of Australian agricultural both nationally and globally. Presenting a united front and pushing to create a global Australian brand will be vital to the success of this endeavour.

Skilling industry bodies as well as producers to enable them to be proactive not reactive in presenting their stories is important for them to be shown in a positive light and start to change the perception of agriculture. Social media can be a powerful tool in both creating and destroying images, thus workshops to show the agricultural community how to construct open, positive, education conversations would be a worthwhile investment.

6. Changing perceptions – build trust in and value agricultural producers

We have identified there is a need to alter the way agriculture and farming is perceived by Australian consumers and the general public. This perception needs to change from an uneducated, unproductive sector, to the more accurate representation of industries at the forefront of the world who are innovative and use cutting edge technology and production systems to produce some of the world's most sustainable and safe food and fibre products.

Educating the public at a young age on the need for agriculturalists could help change this view. Developing ways to incorporate the link to the producers in food and clothing choices can assist consumers to develop a sense of connection "from molecule to commodity." For the agricultural sector to positively influence these perceptions requires a direct link with stakeholders, which can be achieved through better utilisation of new and existing technologies. An important avenue to change perceptions is to reach out more to consumers, better understand the factors that drive consumption decisions (often at point of purchase), and then match this information with new technological frontiers.

The Horizon Scholarship is an initiative of the Rural Industries R&D Corporation (RIRDC) that aims to attract more school leavers to undertake university degrees in agriculture-related disciplines. The Scholarship offers $5,000 per annum for the duration of a Scholar's university degree and provides the students with work placements, mentors and a range of personal development opportunities.

The Scholars come from every state in the country and are studying for a range of university degrees, including veterinary science, natural resource management, agricultural science and agribusiness across 11 different universities.

Sponsors of the Horizon Scholarship are the Grains Research and Development Corporation, the Cotton Research and Development Corporation, Meat & Livestock Australia, Australian Egg Corporation Ltd, Australian Wool Innovation, Horticulture Innovation Australia, Sugar Research Australia Research, the McCaughey Memorial Institute, RIRDC, RIRDC Chicken Meat Program, RIRDC Rice Program and RIRDC Honey Bee and Pollination Program.

More information about the Horizon Scholarship and Scholar profiles can be found at www.rirdc.gov.au/horizon.

Media contacts:

Kirsty McCormack, Horizon Scholar, UNE – email horizon@rirdc.gov.au

Charles French, Horizon Scholar, UNE – email horizon@rirdc.gov.au

Jennifer Medway, RIRDC Horizon Scholarship Program Manager