



PILLAR 4:

# INNOVATION

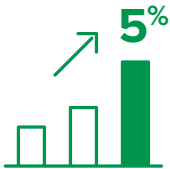
“Growers are innovators. The possibilities for automation and robotics are endless and we want the South Australian grain industry to be playing a major role in this space.”

PILLAR CHAMPION TANJA MORGAN

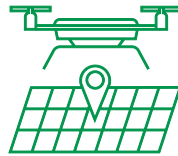
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# 2030 VISION

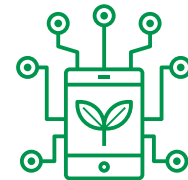
South Australia will be the national leader in cutting edge agricultural science and technology that improves both the quality and quantity of our grain products and reduces the cost of production in a changing climate.



Achieve a reduction of input and labour costs associated with production by 5% to improve profitability of grain production



SA grain producers must have access to and understand the tools and technology that allow increased product quality and quantity and reduce costs in an environmentally sustainable way



On-farm productivity driven by adoption of best technology

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## Innovation has a key role as a driver of productivity growth.

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Growers have always been early adopters of technology and have always been prepared to innovate in their approaches to production, agronomy and farming systems. They have demonstrated a willingness to look abroad for new ideas and accept recognised research as a guide to future developments. As a result, crop water-use efficiency has doubled in the past 15 years and, combined with other yield improvement initiatives, on-farm innovation has added significant farm gate value.

Farming systems groups have played a key role in driving on-farm practice change through localised research, development and extension. There are 18 of these groups in SA which have a direct reach to approximately 75% of broadacre farmers. These groups will continue to be a key influencer in accelerating the adoption of innovative research and technology on-farm, as will consultants, ag bureaus and other related groups.

Growers' willingness to consider innovative new technologies has been driven by the need to remain commercially viable and environmentally sustainable, particularly in Australia's challenging and variable growing conditions. Hence, a very pragmatic target of this pillar is for growers to have access to the latest tools and technology to reduce input and labour costs associated with production by 5%.

It is clear that growers are prepared to incur additional production costs if greater productivity or environmental benefits occur as a result, however this is a modest goal which reflects the intensely competitive environment growers operate in. It also underscores the necessity for South Australian growers to have access to the latest technologies to remain competitive with interstate and overseas growers.

By 2030, SA's grain industry will need to incorporate the latest innovations in areas such as agtech (including robotics, automation and gene technology), record keeping, information gathering and decision making. This will be critical as growers contend with escalating climate change challenges and rapidly advancing competitors such as the Black Sea.

This pillar also identifies the necessity for SA's grain

industry to work collaboratively with State Government and other institutions to position the Waite Research Precinct as an "Innovation and Translation Neighbourhood" and, in the process, help establish SA as a leader in agtech, plant breeding, food science and sustainable farming practices.

As championed by the South Australian Chief Scientist, there may be the possibility to "integrate a Frontier Technology Capability Centre at the Waite Research Precinct to support small to medium enterprises and business leaders to harness the capability of emerging technologies to add value in competitive global markets and introduce expertise into traditional research areas to enhance the delivery of innovation and impact."

In order to effectively drive innovation, it is important to find avenues to connect developing technologies and science to end users. This will drive faster adaptation and adoption that can address key industry challenges, including climate change. All industry stakeholders need to be part of this process, including universities, research and development organisations, technology companies, farming systems groups, private farm consultants, the retail sector, government and growers.

## ALIGNED PLANS

The National Farmers' Federation (NFF), *2030 Roadmap*

Primary Industries and Regions SA (PIRSA), SA Government and Industry, *Growth State - Food, Wine and Agribusiness Draft Discussion Paper 2019*

Grains Research and Development Corporation (GRDC), *Research, Development and Extension Plan 2018-23*

South Australian Research and Development Institute (SARDI), *Strategic Plan 2018 - 2023*

Chief Scientist for South Australia, *South Australia – The State of Science: The EXCITE Strategic Plan 2020*





## PILLAR 4. INNOVATION

PRIORITIES	TARGETS	PROJECT AREAS
<p><b>Secure the science base to support growth in SA's grain industry by driving innovation in agriculture.</b></p>	<p><b>1.1</b> Ensure SARDI and the Waite Research Precinct are supported to drive research for the benefit of SA's grain industry.</p> <p><b>1.2</b> Establish the Waite Research Precinct as a centre for ag-commercial entities, using the facilities, reputation and location to attract innovators and innovation to SA.</p> <p><b>1.3</b> SA to lead the nation in public investment in grain research and development and innovation.</p> <p><b>1.4</b> Attract plant breeding investment to mitigate the impact of climate change in SA, including potential alternative crops.</p> <p><b>1.5</b> Develop a coordinated focus on major research and innovation schemes, including Cooperative Research Centres relevant to the SA grain industry, which have significant co-investment from federal, international, industry and other sources.</p>	<ul style="list-style-type: none"> <li>• Focus investment in traits to combat the greatest environmental risks to grain production, such as heat, drought, frost and salinity tolerance.</li> <li>• Target postgraduate students to focus on emerging and adopting agtech in SA.</li> <li>• Work with the State Government, the University of Adelaide and other key stakeholders to reposition the Waite Research Precinct - with its statewide, national and global connections - as an "Innovation and Translation Neighbourhood".</li> <li>• Support the location of commercial entities at the Waite Campus to interact with research and help drive priorities for commercialisation.</li> <li>• Establish industry forums to connect researchers and entrepreneurs with 'challenges'.</li> <li>• Develop leading researchers and global innovators in agriculture and create a talent pipeline by supporting early to mid-career researchers in SA while also attracting the best global talent.</li> <li>• Integrate a Frontier Technology Capability Centre at the Waite Research Precinct to support small to medium enterprises and business leaders to harness the capability of emerging technologies to add value in competitive global markets.</li> </ul>
<p><b>Raise industry profile, ensure the correct policy settings and attract investments that recognise sustainability and environmental credentials of SA grain products.</b></p>	<p><b>2.1</b> Establish the Waite Research Precinct as a centre of excellence for agricultural research and applied conservation agriculture.</p> <p><b>2.2</b> Support farmers to adopt sustainable agricultural practices through appropriate policy settings and programs.</p> <p><b>2.3</b> Pursue carbon neutral status for SA's grain industry by 2030 (while remaining profitable).</p> <p><b>2.4</b> Support the work undertaken by farming systems groups, agricultural bureaus and Landscape Boards in research, development and extension.</p> <p><b>2.5</b> Monitor and respond to opportunities in natural capital accounting.</p> <p><b>2.6</b> Leverage major national funding programs to deliver an increased South Australian share of investment to drive industry-research collaboration and economic impact.</p>	<ul style="list-style-type: none"> <li>• Improve access to technology/genetic material and methods to allow sustainable production.</li> <li>• Conduct a study to evaluate and assess the value and importance of a strong science capability to drive innovation at an industry level.</li> <li>• Develop enterprise-level sustainable metrics for grain production to support decision making.</li> <li>• Determine required industry steps to achieve carbon neutrality across the grain industry sectors.</li> </ul>

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## PRIORITIES

## TARGETS

## PROJECT AREAS

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### Increase the production base of SA's grain industry through sustainable intensification of agriculture.

- 3.1** Identify and address land use conflicts to protect arable land available for grain production.
- 3.2** Support GRDC's target to close the yield gap by 20% over the next five years by increasing yield (pa) by a minimum of 1% for cereals, 2% for pulses and 1.5% for oilseeds.
- 3.3** Develop policy settings to ensure access to chemicals, technology and seeds.
- 3.4** Maintain or expand SA's cropping area above 4m hectares by 2030.
- 3.5** Identify marginal land that could be cropped through improved farming practices.
- 3.6** Raise public awareness of scarcity of natural resources and arable land in SA suitable for grain production.
- 3.7** Explore quality traits as a means to improve profitability and sustainability through creating a new market for post-farm gate valorisation.

- Invest in research which targets plant breeding, agronomic management and better use of weather forecasts to develop solutions to frost, heat stress and drought.
- Identify and adapt gene traits that will allow a reduction in chemical and fertiliser use.
- Investigate alternatives to allow for a reduction of chemical spraying and improved stewardship of agricultural chemicals.
- Investigate the benefits of soil amelioration on marginal land.
- Conduct an agricultural land audit to identify strategic cropping land and grain infrastructure for protection through planning policy, in support of a whole-of-government approach to land use conflicts.
- Investigate potential areas for oats as a break crop in marginal land.
- Identify and access value-added nutrients such as iron or zinc.
- Support the development of bio-energy plants with a study on the economics of growers producing biomass crop specifically for bio-energy.
- Support the development of new genotypes and niche crops for quality traits to exploit value adding from grain products.

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### Position SA as the centre for agtech in the Southern Hemisphere.

- 4.1** Accelerate adoption of on-farm innovation in agtech, systems and record keeping.
- 4.2** Improve access to funding opportunities for agtech start-ups.
- 4.3** Influence and forge better collaborative relationships between entrepreneurs, researchers and government.
- 4.4** Aim to attract 30 new agtech companies in SA by 2030.
- 4.5** Facilitate the potential of the 'Internet of Things' and new technologies in agriculture through programs to support adoption on-farm.
- 4.6** Leverage other industries driving innovation in agriculture including defence, space and healthcare.

- Support the establishment of broadacre smart farm trials to understand technology and opportunities for adoption.
  - Endorse, create and support incentive schemes to bring agtech companies to SA.
  - Establish a partnership and coordinate with the emerging space industry in SA to use satellites for information gathering and other technologies that can be adapted for agriculture.
  - Establish working agtech taxonomy in the grain context beyond drones and robotics.
  - Optimise existing agtech to support the development of end user predictive tools for on-farm decision making.
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PRIORITIES	TARGETS	PROJECT AREAS
<p><b>SA grain growers to have the capacity and confidence to adopt new technology.</b></p>	<p><b>5.1</b> Increase the application and uptake of agtech on-farm for data collection.</p> <p><b>5.2</b> Support local grower groups/farming networks in developing their own research priorities and extension activities and improved data integration.</p> <p><b>5.3</b> Accelerate adoption and integration of on-farm innovation in agtech, systems and record keeping.</p> <p><b>5.4</b> Develop a coherent industry-wide response to identify and address areas where technology can quickly be deployed to solve problems.</p> <p><b>5.5</b> Ensure technology development opportunities engage research at local levels.</p>	<ul style="list-style-type: none"> <li>• Develop communications technology to allow accurate and timely diagnosis in the field, including internet connectivity and reliability, to support targets under the Biosecurity and Market Access Pillar for Emergency Plant Pests (EPPs).</li> <li>• Develop programs to assist growers in assessing the viability of agtech investment on their farms.</li> <li>• Examine opportunities with satellite technology for monitoring and data gathering.</li> <li>• Develop the capacity to have weather monitoring stations relevant to each paddock.</li> <li>• Accelerate the development and introduction of remote sensors for pest and disease monitoring, to support the achievement of targets under the Biosecurity and Market Access Pillar and ensure capacity for diagnostic and specialist crop protection.</li> <li>• Support the establishment of a centralised app to give access to real-time information such as grassland fire danger index, fire danger indices and spray drift information including inversion layers.</li> </ul>
<p><b>Maintain and improve the availability of agri-chemicals for grain production and storage.</b></p>	<p><b>6.1</b> Engage with chemical companies within the current framework to encourage the registration of chemicals for use in Australia.</p> <p><b>6.2</b> Support investment in chemical stewardship to maintain 'social licence' to chemical use.</p> <p><b>6.3</b> Conduct a value chain assessment on policy decisions regarding chemical requirements (for example, assess the value of on-board fumigation verses value of current policy).</p>	<ul style="list-style-type: none"> <li>• Identify chemicals used overseas that may be advantageous for future SA cropping systems.</li> <li>• Ongoing assessment of current major grain varieties' resistance to pests/diseases.</li> <li>• Identify what practices are commonly used by direct competitors in regard to loading export consignments.</li> </ul>