Pasture Seeds Program
RD&E Plan 2019-2023

by
J R Oliver, P Orchard and M Bradley

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Foreword

The AgriFutures™ Pasture Seeds Program invests in RD&E to maximise opportunities and minimise risks for a profitable and sustainable certified temperate pasture seeds industry, with a reputation for reliable supply of quality pasture species for commercial use. The Program focuses on temperate pasture species subject to the Australian Government pasture seeds levy, namely, lucerne, sub-clover, other clovers, medics and serradella.

The importance of the certified temperate pasture seeds industry lies in its contribution to the productivity of other agricultural sectors, including pasture-based livestock industries such as beef, sheep and dairy; and export fodder sales.

Consultation with a cross-section of industry leaders identified four priority objectives for this AgriFutures™ Pasture Seeds Program Research, Development and Extension (RD&E) Plan:

1. Increased profitability of certified temperate pasture seed production through improved production and processing efficiency;
2. Certified temperate pasture seed production is a sustainable enterprise capable of responding to potential threats to production and markets;
3. All sectors of the certified temperate pasture seeds industry and allied industries are connected and engaged through effective communication channels; and
4. Temperate pasture seed growers and industry service providers have the necessary training, capability and capacity to adopt and/or promote best management practices and to provide industry leadership.

Program RD&E Plans are a key part of implementing the AgriFutures Australia Strategic R&D Plan 2017-2022 and provide an industry-specific basis for our Annual Operational Plan, guiding AgriFutures Australia’s investments on behalf of industry stakeholders. These RD&E Plans identify and balance RD&E priorities and outcomes to promote industry productivity, profitability and sustainability.

AgriFutures Australia is committed to achieving significant benefits for the pasture seeds industry within our available resources, through the implementation of targeted and high-impact RD&E projects. We will continue to work with pasture seeds stakeholders to ensure that our research priorities are aligned with industry needs and also informed by government priorities.

AgriFutures Australia recognises that the adoption of RD&E outcomes is fundamental to success, and with this in mind, we will focus on RD&E investments that generate both practical and cutting-edge knowledge and innovation that can be readily adopted by growers.

John Harvey
Managing Director
AgriFutures Australia
What is a Five Year RD&E Plan?

The AgriFutures™ Pasture Seeds Program RD&E Plan 2019-2023 has been developed by AgriFutures Australia in consultation with certified seed growers, seed cleaners, commercial seed suppliers, grower organisation representatives, researchers, allied industry stakeholders and agronomy advisers. The Plan outlines the AgriFutures™ Pasture Seeds Program’s RD&E objectives for the next five years, which have been shaped by the goals and strategies of the AgriFutures Australia Strategic R&D Plan 2017-2022.

The AgriFutures™ Pasture Seeds Program RD&E Plan guides researchers and collaborators in the development of research proposals, and it guides AgriFutures Australia in investing Program funds. Delivery of the RD&E Plan is overseen by an Industry Advisory Panel, composed of individuals who have on-ground industry knowledge and expertise, and technical or research experience. The Panel provides recommendations to AgriFutures Australia regarding projects and organisations/individuals that can deliver on key strategies in the Plan, and it advises on how to encourage and promote the adoption of project findings.

There is a direct link between the AgriFutures™ Pasture Seeds Program RD&E Plan and AgriFutures Australia’s Annual Operational Plan, which specifies key performance indicators (KPIs) for levied rural industries, including Pasture Seeds. This RD&E Plan provides a Program-specific framework for meeting the KPIs in the Annual Operational Plan. The AgriFutures Australia Strategic R&D Plan 2017-2022 and Annual Operational Plan are available online: [http://www.agrifutures.com.au/about/corporate-documents/](http://www.agrifutures.com.au/about/corporate-documents/).

The AgriFutures™ Pasture Seeds Program aims to fund projects that reflect and respond to industry needs and concerns. Under this RD&E Plan projects may be procured using open tender (open call), pre-qualified tender and limited tender methods.

Open calls are managed through AgriFutures Australia’s project management system, Clarity. The typical annual open call cycle is:

- October: Open call announced for preliminary research proposals (PRPs)
- November: PRPs submitted by researchers
- Early December: Advisory Panel meets to consider PRPs
- Mid-late December: Researchers notified of PRP outcomes; successful researchers invited to prepare a full research proposal (FRP)
- February: FRPs submitted by researchers
- Early March: Advisory Panel meets to consider FRPs
- Mid-late March: Researchers notified of FRP outcomes; successful proposals proceed to contracting
- May: Projects contracted, typically commencing in July.

Open calls may not run each year under this RD&E Plan. Use of the open call procurement method will depend on industry priorities and pre-existing RD&E expenditure commitments.

Pre-qualified tenders involve approaching potential suppliers who have already been through an initial assessment process. Limited tenders involve an approach to one or more potential suppliers to provide a submission to meet clearly specified procurement terms. The pre-qualified and limited tender methods provide options for procuring projects in a quick and responsive manner, and may be used for projects that seek to address urgent industry issues.

AgriFutures Australia’s Procurement Policy guides the use of the different tender methods.
The Certified Temperate Pasture Seeds Industry

Industry profile

The AgriFutures™ Pasture Seeds Program focuses on certified seed of temperate pasture species subject to the Australian Government pasture seeds levy. This includes lucerne, sub-clover, other clovers, medics and serradella. Certified seed is seed that has been produced in Australia to meet the requirements of a certification scheme. This ensures the genetic identity and purity of a variety is maintained from one generation to the next.

Temperate pasture seed production is concentrated in the more reliable agro-ecological regional locations within south-eastern Australia and south-west Western Australia. It has been estimated there are approximately 500 growers of temperate pasture seed in Australia comprising long-term ‘professional’ seed growers who produce certified seeds under contract for commercial seed companies, and short term ‘opportunistic’ seed growers who may supply the seed trade or sell directly to other farmers (RIRDC, 2014). Lucerne dominates, accounting for about 75% of the area sown and 60% of certified pasture seed produced.

Although there are a number of variables involved, generally certified temperate pasture seed attracts a 20-25% premium price over uncertified seed. Certification is a requirement to access some markets. Certified temperate pasture seed accounts for about 40% of total temperate pasture seed production (inferred from Appendix 2 in RIRDC, 2014) meaning that there is a significant volume of uncertified temperate pasture seed traded domestically.

The importance of the certified pasture seeds industry within Australia lies in its contribution to the productivity of other agricultural sectors. Certified temperate pasture seed contributes to the productivity of pasture-based livestock industries including beef, sheep and dairy. Sown pastures provide break crop benefits for the grains industry and temperate pastures provide cut fodder for the dairy and equine industries together with export fodder sales.

As such, the temperate pasture seeds industry is reliant on the profitability of related commodities such as milk and beef and has a strong dependency on inputs for production such as irrigation water. Pests, diseases and export market demand variability also present risks and constraints to the Australian pasture seeds industry. These factors and varying seasonal conditions contribute to inconsistency in seed demand, and fluctuations in seed production quantities per annum, particularly within species. Often a drop in demand for one species is countered by an increased demand for another.

The average area of land registered for certified temperate pasture seed production over the ten-year period from 2008-2017 has been reasonably constant at around 30,000 ha although the variation between years can be up to 15% (see Appendix 3, Figure 1). Average annual certified temperate pasture seed production over the same period has been somewhat more variable at around 10,500 tonnes with an annual variation of up to 25% (See Appendix 3, Figure 2). Gross Value of Production (GVP) of leviable temperate pasture seeds fluctuates with production but is generally around $50 million (Commonwealth of Australia, 2017). With no real growth in production or GVP over the past decade, the temperate pasture seeds industry appears to be a stable, mature industry.

Around 70% of the certified temperate pasture seed produced is exported. The main export markets for certified temperate pasture seed are Saudi Arabia, Argentina, the United States of America, China and Europe. No growth in export markets is anticipated within the next few years. Indeed, there could be some contraction. Saudi Arabia has started phasing out
domestic green forage production in a bid to reduce water consumption, and has indicated it is likely to significantly reduce imports in the immediate future. This may drive the development of alternative export markets but is not expected to lead to a significant increase in demand.

Domestically, seed prices are dropping for some species and this may result in a reduction in areas sown for certified seed in the short term, in some regions. However, increasing livestock prices have driven an increase in sub-clover demand and there is an expectation of some rebuilding of livestock levels which might result in an increase in the area of improved pasture. Such developments would help offset a decline in export demand although the effect is not likely to be huge. Overall, the most likely outlook for the certified temperate pasture seeds industry over the life of this plan is that it will remain stable.

**Industry position in the AgriFutures Australia life cycle**

AgriFutures Australia clearly defines its role as an investor in industries based on their development stage and their unique industry attributes. The certified temperate pasture seeds industry is an established, mature rural industry. It has a levy arrangement in place to support RD&E and production is relatively stable, as indicated above. The industry chooses to operate its RD&E Program within AgriFutures Australia as this arrangement delivers a number of benefits, including an industry specific focus and a range of administrative efficiencies.

The AgriFutures™ Pasture Seeds Program is managed under the AgriFutures Australia “Growing Profitability” arena. The goal of this arena is to enhance the profitability and sustainability of our levied rural industries. Arena priorities include engaging industry participants in determining RD&E priorities, investing in innovation that assists levied industries to be more profitable, and delivering outcomes to maximise industry uptake and adoption. The target outcome for this arena is to ensure that industry participants are confident their levy investment is delivering value.

**Financial commitments**

The AgriFutures™ Pasture Seeds Program is supported by a statutory levy on certified seed sales in both domestic and export markets. The levy is currently struck at between $10/tonne and $15/tonne depending on the category of seed being certified. Through levy payments the certified temperate pasture seeds industry has made an average annual contribution to the AgriFutures™ Pasture Seeds Program of approximately $156,000 over the period 2013 – 2018.

Half of Program expenditure, including R&D expenditure, is matched by the Australian Government at a level up to 0.5% of industry GVP. Between 2013 – 2018 Australian Government contributions to the AgriFutures™ Pasture Seeds Program averaged approximately $190,000 per annum. Other Program income, including interest and royalties, averaged approximately $65,000 per annum.
Pasture Seeds Program Five Year Plan 2013-2018: Review Summary

An independent review of the Pasture Seeds Program Five Year Plan 2013-2018 was conducted by Agtrans Research (2018). The review involved an impact assessment of Pasture Seeds Program R&D investment, covering projects funded during the five years ended 30 June 2014 to 30 June 2018.

The review noted that the Pasture Seeds Program Five Year Plan 2013-2018 (RIRDC, 2014) had an overarching enabling objective, Improved alignment between industry objectives and research and development outcomes, to ensure the ongoing relevance of Pasture Seeds Program RD&E investments by fostering alliances, collaborations and partnerships with other research corporations, researchers and the commercial seed sector. As an enabling objective it is not clear how it was meant to be actioned or indeed whether it was. Despite this, the building of alliances, collaborations and partnerships remains important for the industry, so this new Plan places renewed emphasis on industry connectivity and communication through a specific RD&E objective and clear delivery strategies (outlined below).

Beyond the enabling objective, the Pasture Seeds Program Five Year Plan 2013-2018 outlined four main objectives in the following priority order and with target proportion of funding in parentheses:

1. Focus on growth of domestic and export pasture seeds markets (15%);
2. Improved industry capacity through skills and leadership training (15%);
3. Production and processing efficiency and improved sustainability (50%); and
4. Improved industry knowledge with data, extension and communication (20%).

The Agtrans Research review identified that 15 projects were funded in the 2013-2018 period. Between these 15 projects outputs were delivered to all four Program objectives, with some projects contributing outputs to more than one Program objective. However, objective 3 received a disproportionately higher allocation of funding (estimated as 81%) than originally planned, whereas objectives 2 and 4 received a disproportionately lower allocation (2% and 6% respectively).

The Agtrans Research evaluation did comment on challenges of identifying impact of investment. Because the Pasture Seeds R&D Program is characterised by a wide diversity of outcomes and impacts the evaluation report recommended structuring any future R&D plan around outcome areas. Nonetheless, there were very positive results in terms of the number, range and value of impacts identified, which demonstrated investment in the Pasture Seeds R&D Program over the past five years delivered significant impact and provided a positive return on investment, with a benefit-cost ratio of between 6.5 and 23.6 to 1.

The ongoing relevance of the 2013-2018 Five Year Plan objectives was tested by AgriFutures Australia through consultation at an industry stakeholder workshop in Adelaide, 5 – 6 June 2018. Participants at the workshop included the AgriFutures™ Pasture Seeds Advisory Panel and representatives from all sectors of the temperate pasture seeds industry including certified seed growers, seed cleaners, commercial seed suppliers, industry association representatives, researchers and agronomy advisers (see Appendix 4 for a list of workshop attendees). Key conclusions were:
Objective 3 (Production and processing efficiency) was considered to be relevant and a high priority although the feeling was that it needed to be split to differentiate between short term production and processing improvements and longer-term sustainability issues.

Objectives 2 (Improved capacity) and 4 (Improved industry knowledge) were also considered very important and relevant. Initially consideration was given to combining objective 2, objective 4 and the enabling objective into a single capacity – connectivity – communication objective but in the end it was felt that connectivity and communication were distinct from capacity building and there should be a separation of investment along those lines.

It was felt that pursuing growth in markets (objective 1), although important, was a much lower priority and the limited Program budget would be better directed to the other investment areas.
Pasture Seeds Program RD&E Principles, Objectives, Strategies and Outcomes 2019-2023

As mentioned above, an industry stakeholder workshop was held in Adelaide in June 2018 to review the previous Pasture Seeds Program Five Year Plan 2013-2018 and obtain input for this new Plan. The workshop provided industry stakeholders with an opportunity to outline the major concerns and obstacles facing the certified temperate pasture seeds industry, the types of RD&E that could assist in overcoming these issues, and key RD&E priorities for the future.

Principles

Three overarching principles were identified to guide investment in RD&E projects:

- All projects funded should specify clear outcomes or KPIs, and include clear extension and adoption components;
- Projects should seek to address industry-specific RD&E areas where market failure exists; and
- Objectives are highly interlinked and where appropriate, projects should indicate and apportion their inputs/outcomes across all relevant objectives.

Objectives and Strategies

The comments and opinions received from stakeholders have been consolidated into four key RD&E objectives and associated strategies, which are outlined below in priority order. All references to temperate pasture seed production in the objectives and strategies are focused on species subject to the Australian Government pasture seeds levy, including lucerne, sub-clover, other clovers, medics and serradella.

As noted in the previous section, the evaluation of investment in the Pasture Seeds Program 2013-2018 (Agrtrans Research, 2018) recommended any future R&D plan be structured around outcome areas. With this in mind, the objectives have been worded so they can be read as outcome areas, and their supporting strategies provide more specific direction, in line with RD&E priorities identified during consultation with industry stakeholders. The expectation is that final project specifications agreed between the AgriFutures™ Pasture Seeds Program and contracted research organisations will more explicitly detail expected RD&E outcome(s) and impact(s).

Objective 1: Production and processing efficiency and profitability

Increased profitability of certified temperate pasture seed production through improved production and processing efficiency.

In the context of this Plan, ‘market failure’ refers to under-investment or complete lack of investment in RD&E areas that could deliver benefits to pasture seed levy payers.
Strategies

1.1. Inform growers’ variety selection decisions and agronomic practices by supporting objective regional and/or local variety specific agronomy trials that include seed production measurements.

1.2. Improve the efficiency of harvesting, processing and cleaning of temperate pasture seeds by supporting machinery research that has an emphasis on increasing the ease, safety, efficiency and cost effectiveness of seed harvesting/processing/cleaning, and reducing screenings and environmental impacts.

1.3. Improve industry productivity through investment in pollination research that specifically addresses growers’ needs.

1.4. Support initiatives in plant breeding and germplasm evaluation of new/improved varieties.

Outcomes/benefits

- Growers have access to variety information and agronomic advice to support profitable pasture seed production.
- Machinery improvements identified.
- Pollination requirements and best practices identified to improve industry productivity.
- New/improved varieties evaluated to support increased production and profitability.

Indicative share of RDE budget: 40%

Objective 2: Sustainable certified temperate pasture seed production

Certified temperate pasture seed production is a sustainable enterprise capable of responding to potential threats to production and markets.

Potential threats could include production threats such as biotic and abiotic stresses, biosecurity incursions, availability of and access to genetic diversity; or threats to market accessibility such as accidental events related to genetically modified organisms, or impurities.

Strategies

2.1. Develop and implement improved disease, weed and pest management for leviable temperate pasture seed species by supporting the development of integrated pest management (IPM) and integrated weed management (IWM) strategies.

2.2. Improve water productivity for certified temperate pasture-seed growing by supporting regional and/or local variety specific agronomy trials that include an irrigation component.

2.3. Develop seed harvesting and processing practices that improve environmental outcomes and support the industry’s social licence to operate, through investing in innovative machinery research and upskilling of seed processors and cleaners.

2.4. Investigate and facilitate the use of alternative chemicals.
2.5. Support the industry’s capacity and capability to respond to urgent issues that have the potential to affect its sustainability, through quick-response RD&E projects.

2.6. Support availability and access to genetic resources and services such as the Australian Pastures Genebank, that underpin improved variety development and research.

Outcomes/benefits

- Certified temperate pasture seed production is perceived as a well-managed, low risk enterprise with demonstrable stewardship of soil and water assets, and effective management of disease, weeds and pests.
- Alternative chemicals are identified for industry use.
- The industry can respond quickly to urgent issues that have the potential to affect its sustainability.
- Genetic resources are available to support industry sustainability over the long-term.

Indicative share of RDE budget: 40%

Objective 3: Connectivity and communication

All sectors of the certified temperate pasture seeds industry and allied industries are connected and engaged through effective communication channels.

Strategies

3.1 Develop processes and/or networks for collection of certified pasture seed industry statistics to inform industry and Program decisions (refer to priority project outlined above).

3.2 Develop networks to improve connections between and facilitate input and feedback from growers, through initiatives that might include facilitating participatory research opportunities between growers and researchers to improve adoption and feedback; or motivating growers to adopt research outputs, make changes, and/or provide information on the impacts of funded projects (agronomic, economic, environmental, social).

3.3 Improve engagement with and leverage of funding from other sources, through developing collaborations with allied industries including those that are pasture seed end-user groups (e.g. Meat and Livestock Australia, Dairy Australia, Australian Wool Innovation).

Outcomes/benefits

- Statistics are available to inform industry decisions and policy, and AgriFutures™ Pasture Seeds Program investment decisions.
- All industry sectors feel more engaged and involved with RD&E, and are more aware of and benefit from the AgriFutures™ Pasture Seeds Program.
- Research collaborations deliver high-value, high-impact RD&E.

Indicative share of RDE budget: 10%
Objective 4: Building industry capability and capacity

Temperate pasture seed growers and industry service providers have the necessary training, capability and capacity to adopt and/or promote best management practices and to provide industry leadership.

Strategies

4.1. Support initiatives that encourage growers and service providers (e.g. agronomists) to complete professional development and industry training courses.

4.2. Upskill and encourage growers to become involved with every aspect of the industry e.g. take on leadership roles.

4.3. Promote network building by funding growers’ attendance at industry workshops and conferences.

4.4. Foster international linkages across the industry for the identification and promotion of world’s best practice.

Outcomes/benefits

• The temperate pasture seeds industry has strong leadership and is perceived as using best management practices.
• Growers are confidently contributing to and actively defining the industry’s direction.

Indicative share of RDE budget: 10%
Priority Project

The lack of up-to-date industry statistics that profile the size and scope of the certified temperate pasture seeds industry, including the number of growers and where they are located, is an issue for effective delivery of this RD&E Plan and for AgriFutures™ Pasture Seeds Program management. To appropriately measure outcomes, change and the impact of the AgriFutures™ Pasture Seeds Program it is necessary to be informed of the industry’s current status. As an immediate priority, a project will be commissioned to collect up-to-date industry statistics to supplement the certified seed production statistics collated by the Australian Seeds Authority. Information from this project will underpin the four objectives and strategies outlined above.
Appendices

Appendix 1: AgriFutures™ Pasture Seeds Program RD&E Plan on a Page, 2019-2023

Focus: Certified seed of temperate pasture species subject to the Australian Government pasture seeds levy, including lucerne, sub-clover, other clovers, medics, serradella.

Overarching principles:
- All projects funded should specify clear outcomes or KPIs, and include clear extension and adoption components;
- Projects should seek to address industry-specific RD&E areas where market failure exists; and
- Objectives are highly interlinked and where appropriate, projects should indicate and apportion their inputs/outcomes across all relevant objectives.

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<tr>
<td>Strategies</td>
<td>1.1 Variety specific agronomy trials to inform variety selection decisions and agronomic practices</td>
<td>2.1 Development of IPM and IWM strategies for improved disease, weed and pest management</td>
<td>3.1 Develop processes and/or networks for collection of industry statistics</td>
<td>4.1 Encourage growers and service providers to complete professional development and industry training courses</td>
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<td>1.2 Machinery research to improve efficiency of harvesting, processing and cleaning of temperate pasture species</td>
<td>2.2 Variety specific agronomy trials that have an irrigation component, to improve water productivity</td>
<td>3.2 Develop networks and participatory research opportunities to improve connections between, and facilitate input and feedback from growers</td>
<td>4.2 Upskill and encourage growers to become involved with every aspect of the industry</td>
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<td>1.3 Investment in pollination research</td>
<td>2.3 Development of seed harvesting and processing practices that improve environmental outcomes</td>
<td>3.3 Improve engagement with and leverage of funding from other sources, through developing collaborations with allied industries</td>
<td>4.3 Promote network building by funding growers’ attendance at industry workshops and conferences</td>
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<td>1.4 Support initiatives in plant breeding and germplasm evaluation</td>
<td>2.4 Investigate and facilitate the use of alternative chemicals</td>
<td>2.5 Quick response projects that support the industry’s capacity and capability to respond to urgent issues</td>
<td>4.4 Foster international linkages to identify and promote world’s best practice</td>
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<td>2.6 Support availability and access to genetic resources and support services</td>
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<td>Outcomes/ benefits</td>
<td>Grows have access to variety information and agronomic advice to support profitable pasture seed production</td>
<td>Certified temperate pasture seed production is perceived as a well-managed, low risk enterprise with demonstrable stewardship of soil and water assets, and effective management of disease, weeds and pests</td>
<td>Statistics are available to inform industry decisions and policy, and AgriFutures™ Pasture Seeds Program investment decisions</td>
<td>The temperate pasture seeds industry has strong leadership and is perceived as using best management practices</td>
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<td>Machinery improvements identified</td>
<td>Alternative chemicals identified for industry use</td>
<td>All industry sectors feel more engaged and involved with RD&amp;E, and are more aware of and benefit from the AgriFutures™ Pasture Seeds Program</td>
<td>Growers are confidently contributing to and actively defining the industry’s direction</td>
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<td>Pollination requirements and best practices identified to improve industry productivity</td>
<td>The industry can respond quickly to urgent issues that have the potential to affect its sustainability</td>
<td>Research collaborations deliver high-value, high-impact RD&amp;E</td>
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<td>New/improved varieties evaluated to support increased production and profitability</td>
<td>Genetic resources available to support industry sustainability over the long-term</td>
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Budget share

| 40% | 40% | 10% | 10% |
### Appendix 2: Alignment of Program RD&E objectives with AgriFutures Australia and Australian Government priorities

<table>
<thead>
<tr>
<th>AgriFutures™ Pasture Seeds Program RD&amp;E Objective</th>
<th>AgriFutures Australia Priority (Relevant to arena 3, Growing Profitability, levied rural industries)</th>
<th>Rural Industries Priorities (Identified for AgriFutures Australia arena 3, during industry consultation &amp; by advisory panels)</th>
<th>Rural Research Development &amp; Extension Priorities (Australian Government)</th>
<th>Science &amp; Research Priorities (Australian Government)</th>
</tr>
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</table>
| Production and processing efficiency and profitability | - Investing in innovation that assists levied industries to be more profitable | - Increased productivity  
- Pest and disease protection  
- Meeting market requirements | - Advanced technology  
- Biosecurity  
- Soil, water and managing natural resources | - Food  
- Soil and water  
- Environmental change |
| Sustainable certified temperate pasture seed production | - Investing in innovation that assists levied industries to be more profitable | - Increased productivity  
- Biosecurity  
- Pest and disease protection  
- Meeting market requirements  
- Emerging technologies | - Advanced technology  
- Biosecurity  
- Soil and water and managing natural resources | - Food  
- Soil and water  
- Environmental change |
| Connectivity and communication | - Delivering outcomes to maximise industry uptake and adoption  
- Engaging industry participants in determining RDE priorities | - Increased productivity  
- Adoption of research  
- Meeting market requirements | - Advanced technology  
- Adoption of research & development | - Food  
- Environmental change |
| Building industry capability and capacity | - Delivering outcomes to maximise industry uptake and adoption  
- Engaging industry participants in determining RDE priorities | - Increased productivity  
- Emerging technologies | - Advanced technology  
- Biosecurity  
- Soil and water and managing natural resources  
- Adoption of research and development | - Food  
- Soil and water  
- Environmental change |

References: AgriFutures Australia Strategic R&D Plan 2017-2022; Department of Agriculture and Water Resources; Department of Industry, Innovation and Science
Appendix 3: Industry Analysis

The pasture seeds industry underpins Australia’s pasture-based livestock production. Australia’s temperate pasture legumes have been developed to fit diverse climates, soil types, farming and livestock production systems across the temperate regions of south-eastern Australia and south-west Western Australia.

The certified pasture seeds industry is a small industry in comparison to other broadacre industries. Indeed, it could be described as a cottage industry having a number of disparate and informally organised seed growers. Lucerne Australia provides representation for lucerne growers but there is little formal organisation among seed growers of other leviable temperate pasture seed species.

Certification is required for export markets and some domestic markets. Generally certified seed growers are contracted by larger seed distributors. Nonetheless there is a considerable market domestically for uncertified seed. The price premium and guarantee of market through contractual arrangements are key attractions for certified seed producers.

The only formal industry statistics recorded within the temperate pasture seeds industry are those collated by the Australian Seeds Authority (ASA) on the area and volume of certified seed produced each year as these relate to levy collection. Levies are only collected on certified seed production of the temperate pasture species specified in Schedule 21 of the Primary Industries (Excise) Levies Act 1999. AgriFutures Australia manages the expenditure of the research levy.

For the past decade the area registered for certification of temperate pasture seeds has been around 30,000 ha with annual variation up to 15%. There was a general slow decline from 2008 to 2014 but it has since recovered (see Figure 1). Lucerne has dominated, accounting for about 75% of total area sown.

Figure 1. Areas of temperate pasture seeds registered for certification.
(Data sourced from: Australian Seeds Authority Ltd., 2013 and 2018a)

Not all areas of temperate pasture seed sown and registered for certification proceed to harvest or final certification. Consequently, the volume of certified seed produced annually in
the past decade has fluctuated somewhat more than the fluctuations in area sown (see Figure 2). 2011 was a particularly low production year. If 2011 is excluded the annual production has fluctuated around 10,500 tonnes by up to 25%.

These figures are not indicative of the total pasture seed market as there is a significant volume of pasture seed that is either: i) uncertified and sold outside of the ASA certification scheme, or ii) is certified by ‘in-house’ certification schemes within seed companies. Currently the volume of pasture seed produced and processed through either option is open to speculation. A survey conducted in 2013 to inform the Pasture Seeds Program Five Year Plan 2013-18 suggested that certified temperate pasture seed production comprised 40% of the total temperate pasture seed market (RIRDC, 2014).

Lucerne dominates temperate pasture seed production. There is a small degree of substitution between lucerne and clover or sub-clover but largely fluctuations in lucerne seed production are strongly reflected in fluctuations of total production (Figure 2). Australian lucerne seed is coming under increasing competition for market share and market access in export markets primarily from lucerne seed from California, USA; yet the USA is Australia’s second largest export market, after the Middle East (Hudson, 2017)

Following a period of growth from 2002-2008, indications are that over the past decade, 2008-2017, the certified temperate pasture seeds industry has been flat. There are some challenges ahead for the industry to re-ignite growth by stabilising and revitalising current markets and expanding into new horizon markets.

Advances in biotechnology and various molecular breeding technologies have created opportunities for significant product improvements and cost efficiencies in plant breeding variety development. However, the lack of harmonisation with market acceptance has created considerable risk. Should an accidental event occur in an Australian export shipment, Australia’s export and domestic ‘GM-free’ markets would suffer disruption and possibly closure. Certification of temperate pasture seeds should provide insurance against this occurring but is not an absolute protection.

Figure 2. Trend in annual production of certified temperate pasture seeds.
(Data source: Australian Seeds Authority Ltd (2018c).)
Appendix 4: RD&E Plan Industry Consultation – Workshop Attendees

A workshop was conducted in Adelaide, 5 – 6 June 2018, where industry stakeholders outlined the major concerns and obstacles facing the certified temperate pasture seeds industry, the types of RD&E that could assist in overcoming these issues, and the key priorities going forward. Additional feedback was also sought from workshop attendees via email and face to face meetings.

Workshop participants are listed in the table below. Participants included the AgriFutures Australia Pasture Seeds Advisory Panel and representatives of all sectors of the pasture seeds industry including certified seed growers, seed cleaners, commercial seed suppliers, industry association representatives, researchers, and agronomy advisers.

<table>
<thead>
<tr>
<th>Attendees</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Peter Orchard</td>
<td>Research Scientist, Graham Centre for Agricultural Innovation,</td>
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<td></td>
<td>Charles Sturt University, NSW (workshop facilitator, drafting RD&amp;E Plan)</td>
</tr>
<tr>
<td>John Oliver</td>
<td>Private consultant, NSW (drafting RD&amp;E Plan)</td>
</tr>
<tr>
<td>Lisa Anderson</td>
<td>Pasture Seeds Advisory Panel Chair, Farmer and Partner of Elwood Pastoral</td>
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<td></td>
<td>Company, NSW</td>
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<tr>
<td>Brian Field</td>
<td>Pasture Seeds Advisory Panel member, Senior Industry Development and</td>
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<td></td>
<td>Engagement Officer, University of Tasmania, TAS</td>
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<tr>
<td>Mary-Jane Rogers</td>
<td>Pasture Seeds Advisory Panel member, Senior Research Scientist (pasture</td>
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<tr>
<td></td>
<td>agronomy and physiology); Department of Economic Development, Jobs,</td>
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<td></td>
<td>Transport and Resources, VIC</td>
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<tr>
<td>Joe Cook</td>
<td>Pasture Seeds Advisory Panel member, Farmer and Co-owner of ‘Scottswell’,</td>
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<td></td>
<td>SA</td>
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<tr>
<td>David Brown</td>
<td>Pasture Seeds Advisory Panel member, Farmer and Consultant, Access</td>
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<td>Agribusiness Pty Ltd, SA</td>
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<td>Chris Martin</td>
<td>Former Chair, Pasture Seeds Advisory Panel, Manager, Australian Seed &amp;</td>
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<td>Grain Pty Ltd, WA</td>
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<td>Jenny Aitken</td>
<td>Executive Officer, Lucerne Australia, SA</td>
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<tr>
<td>Bruce Connor</td>
<td>Chairperson and Grower Member, Lucerne Australia, SA</td>
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<tr>
<td>Guy Cunningham</td>
<td>Grower Member, Lucerne Australia, SA</td>
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<tr>
<td>Peter Johnson</td>
<td>Program Leader, Feedbase &amp; Animal Nutrition, Dairy Australia, VIC</td>
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<td>Frank McRae</td>
<td>Product Development Manager, AusWest Seeds, NSW</td>
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<td>Carol Harris</td>
<td>Research Scientist, Pastures, Department of Primary Industries, NSW</td>
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<td>Elle Storrier</td>
<td>Director, Macpherson Agronomy Services, NSW</td>
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<tr>
<td>James Sewell</td>
<td>Pasture Agronomy Consultant, Meridian Agriculture, VIC</td>
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<td>Steve Hughes</td>
<td>Curator Australian Pastures Genebank, South Australian Research and</td>
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<td>Development Institute, SA</td>
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<td>Alan Humphries</td>
<td>Pasture Research Scientist, South Australian Research and Development</td>
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<td>Emma Reynolds</td>
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<td>Melanie Bradley</td>
<td>Program Manager, Research &amp; Innovation, AgriFutures Australia, NSW</td>
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References


Australian Seeds Authority Ltd. (2018b) *Certified Seed Produced under OECD, AOSCA and Australian Seed Certification Schemes In Australia in the 12 months to 30 September 2017*. Revised March 2018.


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