THE FUTURE DELIVERY  
OF GRAIN FARM PRODUCTION R&D  
in Western Australia  

Final  

February 15, 2016
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Executive summary

The Grains Industry Group (GIG) is a representative group of grains industry members from key grains industry bodies that have come together for the sole purpose of commissioning a review into optimum model(s) for grain production Research and Development (R&D) in WA. It was formed in August 2015 following an industry meeting of 37 industry representatives with an interest in the future of grains R&D. (Refer to the summary of this meeting in Attachment 5 to the Review Report entitled Alternative Models for the delivery of Grain farm production Research and Development, February 2016).

The catalyst for the meeting was the announcement of DAFWA’s plans to move its grain farm production research and technical staff into a not for profit company limited by guarantee called Grainswest.

GIG understands the drivers behind the proposed establishment of Grainswest and supports in-principle Grainswest being established as a not for profit commercial company limited by guarantee. However, through this report, GIG recommends significant modifications are made to the design and implementation of the entity proposed by DAFWA. For the purpose of clarity in this document, GIG has termed the modified model it describes, as Grainswest PLUS.

GIG maintains that failure to adopt Grainswest PLUS will result in an entity that does not have the capacity to drive at least a 2% per annum rate of productivity improvement and a sustainable production capacity of 22 million tonnes of grain per year by 2025.

GIG is unanimous in its position that transformational change requires thorough consultation and engagement with industry (such as is occurring now via GIG); and the process of developing a new model for industry should be on a platform of evidence that the pros and cons of alternative structures had first been examined. GIG conducted an extensive review of industry R&D delivery structures and examined over 30 models for delivery of R&D. This research revealed five key findings:

- All R&D delivery structures reviewed had government funding;
- All R&D delivery structures reviewed in Australia or overseas involved universities and the trend is to move towards delivery models that increase the involvement of universities;
- Collaboration with other organisations is essential;
- Co-location assists, but is not a guarantee of collaboration; and
- The activities of the R&D entity are best delivered through a single management structure.

GIG members drew on these key findings and supporting documentation to form 9 imperatives and three recommendations for the establishment of Grainswest PLUS, to be implemented as a package in order for the grains industry to have confidence the new entity can meet its future needs.

Imperatives

1. Commission development of an industry-endorsed business plan for Grainswest PLUS, built from a rigorous assessment of current and future demand for its services through comprehensive consultation with the industry and the GRDC, before Grainswest PLUS is established.

2. Grainswest PLUS must have an independent chairman and a skills-based board with direct grower and grains industry experience, together with strong industry linkages through consultative mechanisms and co-invested projects with the commercial sector, to ensure industry relevance and engagement is achieved;

3. Grainswest PLUS requires long term (5-year plus) contractual commitment from the two founding members - the Western Australian Agricultural Authority (WAAA)¹ and the GRDC, plus documented support from participating universities that underpin their commitment to 3-8 year applied R&D;

¹ the legal authority name for DAFWA
4. An initial five-year financial commitment, with a contractual obligation that seamlessly moves to a rolling five-year arrangement linked to performance, is essential for resource planning and attracting and retaining high performing staff;

5. Capacity and capability of *Grainswest PLUS* is to be built from an assessment of current and future demand for services conducted by the board and founding members, WAAA and the GRDC. It should not be linked to current grains-industry staffing at DAFWA;

6. Quality commercial, science and people leadership and the establishment of a collaborative culture in *Grainswest PLUS* are critical;

7. *Grainswest PLUS* should be established with its management at a Perth administration node with its infrastructure and staff to be located in Perth and at regional locations on a best business case needs basis;

8. *Grainswest PLUS* should aim to maximise the involvement of universities for the delivery of grain farm production research;

9. *Grainswest PLUS* should not compete with services that can be provided by the commercial sector and other organisations that could result in a net loss of capacity servicing the industry;

**Recommendations**

Other GIG recommendations for the R&D structure for the WA grains industry and not specific to the establishment of *Grainswest PLUS* are:

10. An independently controlled trust is established to acquire the existing Government owned Research Stations and other infrastructure, plant and equipment used by the Grains Industry and place these under management for the long term benefit of the grains industry.

11. The Minister for Agriculture and Food should establish an Agricultural Research and Development Alliance with the aim of fostering collaboration and planning for the R&D capacity to meet the needs of the WA agricultural sector. This should include a WA grains R&D network;

12. GIG supports the Chief Scientist and the Minister for Agriculture and Food developing a “Vision for Agriculture” to drive the planning for agricultural research and development capacity in Western Australia in the future.

The scope of this study did not include mapping out the orderly transition from DAFWA to *Grainswest PLUS*. This is the function of the members of *Grainswest PLUS* and the board once the final design criteria of *Grainswest PLUS* have been set and a business plan completed. The staffing of *Grainswest PLUS* is likely to be built over a period of one to two years and there is a need for open and clear communication with DAFWA staff and the unions involved on the processes for future deployment of staff to *Grainswest PLUS*, DAFWA or other organisations.

The Table 1 over summarises existing grains R&D at DAFWA and compares this against the Grainswest model prepared by DAFWA and the Grainswest PLUS model prepared by GIG.
<table>
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<th><strong>Scope/focus</strong></th>
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<th>Grainswest</th>
<th>Grainswest PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal structure</strong></td>
<td>Government Department</td>
<td>Not for profit company limited by guarantee</td>
<td>Not for profit company limited by guarantee</td>
</tr>
<tr>
<td><strong>Membership/Partners</strong></td>
<td>Minister for Agriculture and Food</td>
<td>DAFWA - others by approval of DAFWA.</td>
<td>DAFWA and GRDC. Others by approval of members.</td>
</tr>
<tr>
<td><strong>Board</strong></td>
<td>None</td>
<td>Skills based board appointed by members and then adding directors by existing directors</td>
<td>Independent panel to appoint a skills based board with an independent chair the inclusion of grower and commercial experience</td>
</tr>
<tr>
<td><strong>Financial commitment</strong></td>
<td>Determined by DAFWA and Minister’s priorities within State Government’s four year DAFWA Budget projections and funding committed by GRDC for projects</td>
<td>A five year commitment from the State Government until 2020 and then subject to negotiation.</td>
<td>Rolling five-year commitment from State Government and other partners to establish and maintain capacity.</td>
</tr>
<tr>
<td><strong>Start-up projects</strong></td>
<td>Not applicable</td>
<td>All current 60 GRDC funded projects with DAFWA novated across</td>
<td>Selected GRDC funded projects novated across with some projects going to other delivery organisations or remaining in DAFWA until completion.</td>
</tr>
<tr>
<td><strong>Staffing</strong></td>
<td>195 staff</td>
<td>“Carve out” of approximately 150 research and technical staff and 20 management and administration staff.</td>
<td>Build of staffing based on capacity demand assessment and the GRDC projects novated across after a review of relevance</td>
</tr>
<tr>
<td><strong>Location of the company</strong></td>
<td>DAFWA South Perth campus with regional based staff</td>
<td>DAFWA Northam Office with staff based in other regions</td>
<td>Perth Node with strong regional focus based on project needs</td>
</tr>
<tr>
<td><strong>Research stations and other research infrastructure</strong></td>
<td>Owned and managed by DAFWA with some leasing out of unused land</td>
<td>Access to DAFWA owned infrastructure to Grainswest by way of leases and use agreements</td>
<td>Assets transferred to Grainswest PLUS trust paid for by Royalties for Regions.</td>
</tr>
</tbody>
</table>
Introduction

The Grains Industry Group (GIG) is a representative group of Western Australian grains industry members that came together for the sole purpose of establishing the optimum model for delivering grain farm production research and development (R&D) to the benefit of growers and the State in the future.

GIG approached the task by studying the Grainswest model proposed by the Department of Agriculture and Food, Western Australia (DAFWA) and compared it with the key strengths risks and threats of other existing operating models relevant to the delivery of grain farm production R&D in WA.

GIG found after researching alternative models that the DAFWA-proposed Grainswest model had many components that would be of benefit to the future of the industry. However, GIG has recommended significant modifications it considers as imperative in order to deliver the optimum model. GIG throughout this document refers to the scenario whereby these modifications are incorporated, as the Grainswest PLUS model.

The reader should be aware of the confusion that may arise from the generic use of the term ‘model’ in the discussions about this subject. Wherever possible GIG uses the term ‘R&D structure’ to refer to the overall R&D system, whilst the term model is used to describe an R&D delivery entity which is part of the structure.

Grower and Industry Requirements for the delivery of grain farm production R&D

At a meeting of leaders of the WA grains industry during August 2015, the critical outcomes and services to be achieved for WA grains industry production R&D into the future were identified as:

- validation of research in local environments;
- integration with the bigger agronomic jigsaw for WA grains production; and
- delivery of impact and profitability on the ground.

The elements of a model for a grains R&D entity were seen as:

- united, industry owned approach with a clear, long term vision for the WA grains industry;
- needs to be nimble, flexible and accessible to the industry, with the ability to bring in and out new participants;
- undertaken in a corporate structure (that is, commercially driven) with the capacity to trade and charge fee for service; and
- long-term investment focus to ride the peaks and troughs of funding and research priorities.
Changes in the future grain farm production ecosystem in WA

The GIG considered what the future grain production ecosystem in WA would be like in 10 years’ time. This will influence the type of grain farm production research which will need to be done in the future and will determine the different areas of research activity and the skills which will need to be engaged in conducting future projects at the regional or local level. Grain farm production R&D delivery organisations need to take these changes into account when planning their future resource capacity and staff capabilities that will be required.

GIG identified nine trends that would drive the shape of future grains R&D in WA in a ten-year time frame:

1. Shrinking number of grain farm businesses with remaining farms becoming larger and ever more complex and sophisticated businesses. GIG estimates there are around 4,200 grain growers now in WA with the largest 600 of those producing 85% of grain. In 10 years’ time it was estimated the corresponding numbers would be more like 3,600 growers with the largest 500 growers producing 85% of the grain.

2. Agricultural innovation will increasingly depend on cross sectoral innovations from information and communications technology, biotechnology, and nanotechnology, as well as marketing innovations.

3. ‘Digital farming’ – there will be autonomous vehicles and much greater usage of precision agriculture, robotics, telematics, real-time sensors, information technology and integrated automation systems. This is likely to lead to a greater requirement for engineering and computer based skills in the industry and in grain farm production R&D.

4. Fundamental crop science expertise will still be needed – the future grain farming system will still rely on chemicals and will need access to basic crop science skills such as agronomy, soil conditions, crop protection, plant nutrition to interpret and integrate new knowledge into advances in cropping systems.

5. Greater diversity of crops – there is a need for grain farm production R&D to support growing of niche crops as well as high yield crops for livestock feed markets in Australia and export destinations.

6. More direct supply chains – closer links between growers, or groups of growers and processors, especially in Asia.

7. Further consolidation and shrinking number of life science companies – with an expectation that they will move more into providing services not just seeds, chemicals and fertilisers.

8. Consideration of potential structural changes at GRDC.

9. University research will be more focused on industry needs – the changes in the Federal government funding arrangements are expected to drive engagement with industry and an emphasis on demonstrating measurable impact on the economy (rather than solely based on research excellence).

What will success look like?

Grains industry group members expressed concern about the declining productivity gains for Australian agriculture which appear to have fallen since 2001 from previous high rates and are now below the growth rates of competitive grain crop producing countries.

Current total factor productivity growth rate\(^2\) for WA grain farms is believed to have averaged between 1.2 and 1.5% since 1980, which when coupled with increasing scale of operations, has been just enough to keep farmers ahead of the cost price squeeze and offset the long-term decline in grower’s terms of trade. Of the

\(^2\) The ratio of all market outputs produced to market inputs used, reflecting farmers’ business decisions — for example, and substituting chemical for mechanical cultivation. At an industry or regional level, improvements in TFP also capture increased adoption of best practice, economies of scale, and the exit of less efficient farms. (taken from “Grains Industry National Research, Development and Extension Strategy, 2014” page x)
contribution of R&D to productivity growth, about one-third has been attributed to genetics (varieties) and two-thirds to farm management and agronomy systems (practices). There is evidence that since the mid 1990’s the rate of productivity gain has declined, and the reduced level of government spending on R&D is often claimed as one of the main reasons for this decline.

The WA grains industry members consulted during the preparation of this Report said the desired objective for the outcome from the model for the future delivery of grain farm production R&D should be to assist the grains industry to achieve a target rate of productivity improvement of 2% with a production capability of 20 million tonnes of grain per year. It is recognised that this cannot be achieved by any single entity involved in delivering RD&E services to the WA Grains Industry. Plant breeding programs, agricultural machinery, farm management and marketing will all contribute to the achievement of these targets.

The objective for the future delivery of grain farm production R&D in Western Australia should be to assist growers to achieve a 2% per annual rate of productivity improvement and a sustainable production capacity of 22 million tonnes of grain per year by 2025.
Key messages from a review of alternative R&D structures and models

GIG’s consultants reviewed industry R&D structures and over 30 models for delivering research and development for agricultural, primary industry and resource sectors. A listing of these is provided in Attachment B. An accompanying report prepared for GIG entitled Alternative Structures and Models for the Delivery of grain Farm Production Research and Development is available on request.

There are broadly six alternative models that could be considered for the future delivery of grain farm production R&D in WA. These are:

- Commercial for profit company
- Commercial not for profit company
- Unincorporated joint venture
- Contract with University
- Co-investment in large programs
- Land Grant University

There are examples of all six alternative delivery models for grain farm production R&D operating in Australia. These were reviewed by GIG to establish the strengths and weaknesses to assist in the design of the best structure for the WA grains industry and the design features for an entity to meet the R&D services currently supplied by DAFWA. The Table on the next page compares the major attributes of these six different models.

The study of the different models included a range of research collaboration arrangements.

A recent trend in Australia has been the co-investment by GRDC in R&D programs to provide longer term (for example five years) capacity or provide for multiple outcomes rather than a particular focus on a specified outcome.

Examples include of co-investment is by GRDC and the University of Sydney’s Plant Breeding Institute in the IA Watson Grains Research Institute, Narrabri which the University of Sydney leases from the Wheat Research Foundation (a trust owned by grain growers in the region). The GRDC has entered into a bilateral co-investment agreement with Curtin University to establish the Centre for Crop and Disease Management. There are also examples of bilateral investments by the GRDC with State Government owned delivery agencies to provide programs with multiple outcomes such as with the Victorian Government for genetic resources, high rainfall zone cropping, regional capacity in D&E, cereal pathology and bio-protection; and the South Australian Research and Development Institute (SARDI) for molecular diagnostics for pathogens, oat breeding and pulse pre-breeding.

Government funding

A common factor in every industry R&D structure studied was that there was government funding for research and development as a stimulus for economic development and in recognition of market failure with farm businesses not able to individually invest in R&D to the level required to drive an acceptable rate of productivity improvement. Sometimes the government funding was a modest amount and sometimes it was a large contribution, but mostly ranged in the area of 30-40% of total revenue.

Key Finding 1:

All R&D delivery structures reviewed had government funding.
<table>
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<th>Table 2: Alternative Delivery Models for Grain Farm Production R&amp;D</th>
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<tr>
<td><strong>Commercial for profit company</strong></td>
</tr>
<tr>
<td>Bayer, Monsanto, CSBP, Intergrain, AGT, Kalyx, Eurofins, Living Farm, some CRC’s, NZCRIs, AMPS</td>
</tr>
<tr>
<td><strong>Key features</strong></td>
</tr>
<tr>
<td>• Emphasis on what the customer/funder wants</td>
</tr>
<tr>
<td>• Success is 100% determined by the market.</td>
</tr>
<tr>
<td>• May offer some tax advantages to business and employees</td>
</tr>
<tr>
<td><strong>Strengths/Opportunities</strong></td>
</tr>
<tr>
<td>• Securing funding is difficult</td>
</tr>
<tr>
<td>• Risk from being under capitalised or having insufficient reserves</td>
</tr>
<tr>
<td><strong>Weaknesses/Threats</strong></td>
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Involvement of universities

A common factor in all the R&D structures examined was the involvement of universities as core partners and the trend appears to be for an increasing involvement of universities in delivery models. A key factor for this, in Australia at least, is the funding for science directed by the Federal Government through the university sector. The recent policy announcements of the Federal Government on innovation and encouragement of close collaboration between universities and industries is expected to accelerate this trend.

Key advantages of using universities to deliver grain farm production R&D are:

- the opportunity to leverage universities access to Australian Government funding;
- the ability to harness the skills and capabilities of research and teaching staff from multiple disciplines;
- facilitated access to international R&D via university global scientific networks;
- lower cost research through the engagement of post graduate students in grain farm production R&D projects;
- increasing the research capability through teaching (capacity building); and
- graduates aligned to the grain industry’s needs.

Key Finding 2:

All R&D delivery structures reviewed in Australia or overseas involved universities and the trend is to move towards delivery models that increase the involvement of universities.

Collaboration

Collaboration is essential. It is estimated that Australia in total accounts for around 2% of the global expenditure on R&D across all fields of science. Collaboration at the international, national and local level is imperative to ensure full utilisation of infrastructure and knowledge.

Key finding 3:

Collaboration with other R&D organisations is essential.

Co-location

Co-location has often been cited as providing a solution to obtaining critical mass, access to more multi-disciplinary skills and as a consequence a greater impact through the increased collaboration that co-location should foster. However, this review found that while co-location has the potential to improve collaboration, and therefore efficiency of the RD&E investment, it did not in practice achieve this to any great extent, due to the different organisational structures, line management and drivers of co-located personnel.
Good collaboration is possible with good leadership, but it works best when people are under a single management structure. This is not to say that there were not plenty of examples of close collaboration between individuals in co-located facilities, but it is highly dependent on peoples’ attitudes and the different drivers for co-located organisations do not tend to foster collaboration.

**Key finding 4:**

**Co-location assists, but is not a guarantee of collaboration.**

**Single management structure**

The most successful models were observed to be where the whole business either existed or was transferred in its component entirety to a single entity – usually to a university. Examples of this are the Land Grant Universities in the United States of America, the contracts between the Tasmanian Department of Primary Industries, Parks, Water and Environment and the University of Tasmania (for the Tasmanian Institute of Agriculture), the Queensland Department of Agriculture and Fisheries (QDAF), the University of Southern Queensland (UQ), and the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA)-University of Guelph Partnership Agreement.

Transferring the whole business reduces the transaction costs associated with the complexity of governance arrangements and makes for clear line management and focus on the objectives and outcomes.

**The review highlighted mixed successes with unincorporated joint ventures. Some functioned well, but only where there was exceptionally strong leadership capability. The majority of joint venture examples were burdened by high transaction costs and had inbuilt tensions that were counter-productive to achieving efficiency and targeted outcomes.**

**Key finding 5:**

**The activities of the R&D entity should be delivered through a single management structure.**
The R&D structure for the WA Grains Industry

Not all grain farm production R&D needs to be conducted by a single entity. Indeed, this is already the case in WA with the CSIRO, universities, life science and input supply companies, private contract research service providers for field trials and analytical services, grower groups, agronomists and agricultural consultants and individual growers all contributing delivery services to the grain farm production R&D structure in WA.

GRDC has a useful framework for considering the different types of investment in R, D and E based on the typical investment timeline required, and the expected time before an impact can be expected from that investment:

- High impact strategic research and applied research with a national impact (40% of investment portfolio) generally with an 8+ year investment plan and taking 8+ years to have impact – aimed at accessing the best science available internationally (public or private such as Bayer, Syngenta etc) and in Australia principally from universities and CSIRO ('big R')\(^3\);

- Regional applied research and development R&D (40% of investment portfolio) with a 3-8 year investment plan and impact; finding regional and production zone solutions to specific crop, crop protection, climate and soil variations; typically delivered by state departments and agencies with some delivery by commercial and private providers ('little r and big D'); and,

- Local adaptation, validation and adoption of R&D (20% of investment portfolio) through demonstration trials and extension activities ('little d and big E') - with a 1-3 year investment plan and impact; typically delivered by not for profit grower groups and commercial agronomists and agricultural consultants and supported by extension materials generated through GRDC funded programs. This used to also be the province of state departments of agriculture but now 85% or more delivery is through the private sector.

DAFWA has traditionally provided the majority of the independent science capacity to conduct small “r” and big “D” R&D services for the WA grains industry in the 3-8 year space.

The GIG concluded that, whilst other entities already providing grain farm production R&D in WA will continue to deliver and in some cases expand their capabilities and range of their services, there will still be a very large gap if DAFWA was to withdraw from delivering grain farm production R&D.

\(^3\) Editor’s note - the classifications of big and little RD&E have been added by the Consultants and are not GRDC terminology.
The **Grainswest Model as proposed by DAFWA**

DAFWA has proposed ‘carving out’ the grains R&D activity from within DAFWA and placing it in a new entity, **Grainswest**, as a not for profit company limited by guarantee.

The case for establishing **Grainswest** has already been approved and announced by the Minister for Agriculture and Food at Agribusiness Crop Updates in February 2015 and has been taken to Cabinet as part of the Royalties for Regions funded $20 million Boosting Grains R&D project.

The Vision for **Grainswest** is: “To make the best research and innovation on grain farming readily available to WA grain growers to enhance the profitability and sustainability of their operations and deliver economic benefit to WA”.

It is currently thought that **Grainswest** would comprise an estimated 150 science-based staff at establishment, with an additional 20 support / management staff. These staff would be drawn from the existing 195 staff in the Grains Transformational R&D Directorate.

It is envisaged **Grainswest** would have the following five program streams: Agronomy; Soil Productivity; Crop Protection; Genetic Improvement; and, Farm Business Integration.

The advantages of **Grainswest** as initially put forward by DAFWA were that it would:

- be credible, independent and unbiased.
- be not for profit - allows for reinvestment in further R&D capability.
- have a deep understanding of the production and business challenges facing WA grain growers.
- be backed by the WA Government, but not constrained by red tape.
- have a collaborative approach with agribusiness.
- be an effective vehicle for targeted government and industry investment.
- Inherit a legacy of DAFWA’s grains R&D inherited - knowledge, staff, capabilities, scale, infrastructure, equipment.

Upon incorporation it was envisaged **Grainswest** will, with the approval of the GRDC, take over research projects contracted by GRDC to DAFWA. Key research and management personnel currently employed by DAFWA will transfer to **Grainswest**, along with access to key infrastructure, which will represent DAFWA’s financial stake in the new entity.

The proposal is for the WA Government, through in-kind and cash contributions from DAFWA, to support **Grainswest** during the start-up phase (2015-2020). For funding levels beyond 2020, arrangements would need to be negotiated. **Grainswest** is envisaged to become the main grains research delivery entity in WA with an emphasis on professional and technical capacity in the regions conducting research in growers’ paddocks, funded by WA grain grower levies via the GRDC and through science partnerships with other stakeholders in the grains supply chain to deliver ongoing value through the latest scientific research and developments in grains.

DAFWA states that the aim of establishing **Grainswest** is to ensure more effective and sustainable delivery of grains R&D from the investment by the State and industry to grow the profitability of the of WA grain growing businesses, not to exit funding of grains R&D.

“There appears to be an assumption that the Grainswest initiative is driven out of a DAFWA financial crisis, which is false. DAFWA has been considering alternative delivery models for more than 10 years, and the development of the Grainswest model began in late 2013. There are non-budgetary
limitations to operating within government that impact the ability to ensure ongoing successful delivery of R&D (e.g. the impact of government policies such as recruitment freezes, strict process requirements, HR procedures, lack of flexibility). These limitations need to be clearly understood in order to assess alternative models. Moving out of the government environment will allow provision of more timely, cost-effective R&D that can be better ‘future-proofed’.”

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4 DAFWA Grains Transformational R&D Directorate
**Grainswest PLUS**

The Grains Industry Group (GIG) supports the decision of the Government in establishing *Grainswest* as a not for profit commercial company limited by guarantee. However, the GIG recommends significant modifications to the design of this entity and to be incorporated in its business plan. GIG has termed this modified model *Grainswest PLUS*.

The Grains Industry Group reviewed the alternative structures and delivery models for R&D in Australia and selected overseas countries and distilled out the recommendations that they considered important in designing *Grainswest PLUS* as a new entity for grain farm production R&D in WA. GIG maintains that all the recommendations for the establishment of *Grainswest PLUS* need to be adopted for the industry to accept the proposed development of this new delivery model for grain farm production R&D in WA.

GIG has a vision that *Grainswest PLUS*, with all the recommendations for amendments identified by GIG implemented, can not only serve WA grain growers well into the future but become a national and international centre for Mediterranean dryland cropping systems and agronomy R&D.

### 1. Clarity of purpose

Absolutely fundamental to establishing a new grain farm production R&D entity is clarity of its purpose and function - where grain farm production scientific R&D sits in the grain value chain and how it engages and interacts across the value chain. The focus should be on specifying what R&D services *Grainswest PLUS* will provide based on demand for services and *Grainswest PLUS*’s capability strengths, with a clarity on what the entity does and does not do. It should not be assumed that all of the existing DAFWA grains R&D capability will be transferred to the new entity, nor that rationalisation will be the role of the new entity.

GIG recommends *Grainswest PLUS* should be focused on farming and cropping systems, agronomy (including phenotyping), soil productivity and crop protection. However, GIG recognises that the board should be the determinant of the scope and focus of its activities. It should not attempt to do everything and its programs and staffing should be built on demand for its services, largely informed through the GRDC processes for identifying grain farm production R&D priorities, especially through the Western Panel and the Regional Cropping Systems Network. Some of the current DAFWA planned *Grainswest* activities may be better transferred to universities or other organisations with particular areas of expertise.

GIG recommends the *Grainswest PLUS* board should oversee the build of the activity of *Grainswest PLUS* from a needs basis, rather than a “carve out” of existing projects and activities from DAFWA. The capability build should start with an assessment of the future needs for grain farm production R&D in WA in 5-10 years’ time and a review of the current GRDC funded projects suitable for delivery through *Grainswest PLUS* that GRDC were prepared to novate across. Other GRDC projects, not agreed to be novated across by the GRDC and the *Grainswest PLUS* Board would then be novated across to other appropriate deliverers, terminated or remain in DAFWA until completed.

Irrespective of the quality and capacity of the entity’s starting human, physical and financial resources, a failure to clearly define the purpose and function will ultimately lead to under-delivery and potential failure. A recent review of the Australian Export Grains Innovation Centre (AEGIC) has demonstrated the need for clarity in purpose, focus, engagement along the value chain and the need to avoid the inclusion of non-relevant or non-essential activities.
Formation of the entity should clearly involve government, GRDC, industry, CSIRO and the universities defining the critical industry needs and then the Grainswest PLUS board can assemble the necessary expertise and resources to address the industry’s needs. A wholesale “carve out” of existing resources and capability should be avoided. If some areas of existing capability are in excess future need, decisions on winding these areas up and transferring personnel to other areas within DAFWA or other organisations should be made prior to, not after, transfer to Grainswest PLUS.

Grainswest PLUS should not duplicate services that can be effectively provided by other existing delivery entities, and where it does compete, it should operate with full transparency and on a full cost recovery basis to avoid crowding out alternative delivery providers and reducing the overall research delivery capacity available to the industry.

The transition phase during start-up will require reasonable notice to be given to enable all participants, and staff, time to make other arrangements to complete the projects and transfer to other organisations delivering project in their field of expertise.

As noted previously, engagement across the value chain offers opportunity and value to the industry. Opportunities with grower groups and other extension providers should be thoroughly explored, such as the opportunity for the new entity to provide a coordination point between RD&E delivery.

**Imperative 1:**

**Commission development of an industry-endorsed business plan for Grainswest PLUS, built from a rigorous assessment of current and future demand for its services through comprehensive consultation with the industry and the GRDC, before Grainswest PLUS is established.**

2. **Industry ownership and linkages**

GIG recommends a skills based board of directors be appointed following selection from an independent panel appointed by the founding members. It is recommended that the board be chaired by an independent chairman selected by the independent panel in consultation with the members of the company. The panel should ensure there is appropriate people with grower and commercial experience on the board. Board membership should also include people with science and R&D experience and expertise.

While Grainswest PLUS will have industry consultative mechanisms to ensure it is receptive to industry needs, it is considered critically important that the skills based board of directors with an independent chairman and with membership from people who understand grain growing, growers and commercial expertise will be needed on the board to ensure the entity is effective and is firmly focused on the needs of the grains industry.

GIG noted the success of the Wangeningen University and the “Golden Triangle” R&D structure in the Netherlands and other examples of close involvement across the industry value chain.
Grainswest PLUS needs to implement processes to engage with industry through industry organisations and private commercial companies in the industry through consultative mechanisms, funding initiatives and co-invested projects with commercial companies in the industry.

The use of the WA Government’s Royalties for Regions Science Partnership Fund could be usefully explored to act as a catalyst for funding these linkage mechanisms and projects.

**Imperative 2:**

Grainswest PLUS should be established with an independent chairman and a skills based board with direct grower and grains industry experience, together with strong industry linkages through consultative mechanisms and co-invested projects with the commercial sector, to ensure industry relevance and engagement is achieved.

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### 3. Commitment of the members and deliverers

It is essential that the partners have a long term commitment to Grainswest PLUS. The role of GRDC, as the major funder of grain farm production R&D and the State Government will be critical to the successful establishment of Grainswest PLUS. This is most probably best established through the constitution of the company developed by the founding partners.

GIG recommends commencing the establishment of Grainswest PLUS with two founding members – the Western Australian Agriculture Authority (WAAA), the legal authority name for DAFWA, and the GRDC. Other members to be added as approved by the board.

Grainswest PLUS will involve universities and it will be essential for the participating universities to commit to moving to the 3-8 year applied research and development approach (big “D” as described on page 8 in the previous chapter) and away from their sole focus on just publishing research papers and attracting students. Whilst these drivers will remain, there needs to be an ongoing demonstrable win/win from arrangements put in place to increase university involvement. This will require documented support at the vice chancellor and senate level. Universities tend to be multi-focused and there is a danger that changes in leadership could see changes in enthusiasm and support for arrangements that are put in place.

**Imperative 3:**

Grainswest PLUS requires long term (5-year plus) contractual commitment from the two founding members - the Western Australian Agricultural Authority and the GRDC plus documented support from participating universities that underpin their commitment to 3-8 year applied R&D.
4. Financial commitment

Across all of the R&D structures examined, another consistent feature was the importance of an underpinning financial commitment from the partners. Most consistent in all R&D structures was an on-going commitment (commonly five year cycles) from government; with co-commitments by the university and industry sectors. This review did not identify a single R&D structure where government commitment towards industry good R&D did not exist.

In the study of alternative structures for the delivery of agricultural production R&D it was found that governments understood the justification for public funding on the basis of economic development and market failure. The Grains Industry in WA accounts for over 50% of the gross value of agricultural production and is therefore is a very important component of the WA economy. Stable funding by the WA State Government is fundamental to attracting GRDC investment.

The current funding of grain farm production R&D through DAFWA relies on the Minister for Agriculture and Food’s priorities and DAFWA management’s allocation of the overall State Government four-year budget to the Department, plus some Royalties for Regions funding and then external funding of projects, largely through the GRDC.

The Grainswest model proposes the State government make a five-year financial commitment to the establishment and operations of Grainswest up until 2020 and then leaves it to future negotiations as to the contribution from the state Government after that. Preliminary budget calculations show that in the start-up year Grainswest would need $22.6 million in 2016-17 and $20.5 million in 2017-18. This assumes access and leasing of DAFWA infrastructure to Grainswest.

Commitment of a level of on-going funding of not less than five years is seen as critical in providing a level of certainty for the entity (noting its delivery of short and medium term R&D) and particularly for the attraction and retention of a core staff capability. Without some clear surety for the organisations forward resourcing there is the risk that a number of staff with key capability required by the new entity will seek employment elsewhere, including interstate and overseas, thereby undermining the capability of the new entity.

The uncertainty of forward funding commitment beyond 2020 is unacceptable to the industry and without an ongoing commitment will result in a gross underinvestment in grain farm production by the GRDC in WA.

GIG believes that the State Government, through the Western Australian Agricultural Authority should give an initial 5-year funding commitment, but within that time move to a process with other members, of giving a rolling 5-year commitment to Grainswest PLUS to ensure it has the stability to plan and sustainably build and maintain appropriate capacity. That is not to say that commitments cannot be reduced or increased over time but it will ensure that Grainswest PLUS and its staff have a reasonable level of security to undertake multi-year projects.

Another factor to consider is to try to avoid too much of the funding coming from a single source as this can cause resourcing shocks which would undermine the confidence of world class staff to be part of the entity.

The reality is that the GRDC is, and is most likely to remain, the major funder of grain farm production R&D in Australia.
By having a range of GRDC projects delivered through the entity at any one time should help to mitigate this factor. Nevertheless, the entity should endeavour to have a diversified revenue base from different sources of project funding.

**Imperative 4:**

An initial five-year financial commitment, with a contractual obligation that seamlessly moves to a rolling five-year arrangement linked to performance, is essential for resource planning and attracting and retaining high performing staff.

5. **Staffing**

In parallel with the decisions by the board on the start-up projects for *Grainswest PLUS*, GIG recommends the *Grainswest PLUS* board should oversee the build of the *Grainswest PLUS* staffing complement based initially on an assessment of future capacity required and the requirements of the GRDC projects novated across to *Grainswest PLUS* as reviewed and approved by GRDC and the board. Staffing should not be based on a ‘carve out’ of existing staff in DAFWA deemed to be working in grains R&D.

Remaining staff in DAFWA currently identified in Grains R&D could be transferred, over time, to other universities or organisations involved in grains R&D that are more geared to that area of R&D. In the interim period they should remain in, and be managed by, DAFWA.

Beyond that any staff appointments to *Grainswest PLUS* should be on a needs basis as developed from the assessment of the future needs for grain farm production R&D in WA in five-10 years’ time with a focus on delivering on Cropping Systems Development projects, mainly in the three-eight year range.

**Imperative 5:**

Capacity and capability of *Grainswest PLUS* is to be built from an assessment of current and future demand for services conducted by the board and founding members, WAAA and the GRDC. It should not be linked to current grains-industry staffing at DAFWA

6. **Leadership and a collaboration culture**

Time and time again during the research of different models it was emphasised that people were the key determinant of success and impact. The right leadership, with appropriate clarity of purpose, advocacy and commitment of resources from the members, is critical. Good leadership could make any model work, and the converse, poor leadership does not allow any model to work to its potential.

World class scientific leadership is important in attracting high performing people who want to be part of a winning team.

Leadership of the entity also requires the support and flexibility from the governance structure and the board together with access to the necessary resources to meet the purpose of the entity.
No R&D entity can operate in isolation nor have the skills and capacity to do everything in-house. Collaboration is vital, be it with international organisations, across Australia or with local organisations in WA.

Whilst individual researchers will have their own contacts and collaborators the leadership should encourage and lead by example at the corporate level. To this end active engagement in the National Grains Research and Development Strategy processes and the collaboration mechanisms already established by DAFWA and other research delivery providers in WA will be important for *Grainswest PLUS*.

**Imperative 6:**

*Quality science, commercial and people leadership and the establishment of a collaboration culture in *Grainswest Plus* are critical.*

### 7. Location of the company and staff

It has been proposed by DAFWA that the headquarters of *Grainswest* be at Northam and that centre should house the majority of *Grainswest* staff. Instead GIG recommends the location of staff be based on effectiveness, with staff based in Perth and at regional locations taking into account the nature of work and the need to be flexible and acknowledge that location is a very significant factor in being able to attract the best staff.

While understanding the rationale for placing staff in the regions, GIG acknowledges the reality of the ‘hub and spoke’ nature of the servicing of the grains industry from Perth and the need for *Grainswest PLUS* to have close and constant interactions with the universities and CSIRO. GIG also recognises that in order to attract and retain the top research scientists, social and economic factors such as partner employment prospects, the range of education options and access to health services are also important. For example, GIG noted that Northam has a population of 7,000 compared to 64,000 at Wagga and 15,000 at Horsham.

That said there will be a significant number of staff who will find it more effective and may wish to be located at Northam or other regional locations. GIG believes the location of staff should be flexible and a matter for management and staff to determine, not be driven by an overarching policy position.

In any event there will be a need for all staff to have a focus on having a dialogue with practicing farmers on grain farm production issues and sufficient *Grainswest PLUS* staff based in the regions to provide efficient servicing of research trials in the field and to ensure constant conversations between researchers, farmers, grower groups and others in the industry and interact with the extension providers through grower groups, agronomist and advisers.

**Imperative 7:**

*Grainswest PLUS* should be established with its management at a Perth node with its infrastructure and staff to be located in Perth and at regional locations on a best business case needs basis.
8. The role of universities in the *Grainswest PLUS* model

GIG concluded from the review of alternative structures and models studied that the future delivery of grain farm production R&D in WA is best centred around the R&D capability off the CSIRO and the universities, rather than establish a new completely stand-alone entity. This is to ensure an ongoing strong science base for the organisation and renewal of capacity through engaging research staff and post graduate students in industry issues.

This does not mean that all capacity would be at the one University. The Queensland experience would suggest that using particular universities for their recognised specialty capability had a better outcome than having one all-encompassing entity. That said a substantial part of the business could be with one entity - for example the QDAF and UQ QAAFI arrangement in Queensland or the OMAFRA-U of G Partnership Agreement in Ontario Canada.

**Imperative 8:**

*Grainswest PLUS* should aim to maximise the involvement of universities in the delivery of grain farm production research.

9. Not all grain farm production R&D needs to be delivered through *Grainswest PLUS*

Not all grain farm production R&D needs to be conducted by a single entity. Indeed, this is already the case in WA. However, DAFWA has provided the majority of the independent science capacity to conduct small “r” and big “D” R&D services for the WA grains industry.

The GIG concluded that, whilst other entities already providing grain farm production R&D in WA will continue to deliver and in some cases expand their capabilities and range of their services, there will still be a very large gap if DAFWA was to withdraw from delivering grain farm production R&D.

Some contract research providers interviewed during the course of this Study could envisage expanding into providing research scientists and agronomists to augment their field trial and analytical laboratory services but this would be gradual and would very much depend on demand. Of concern to these contract service providers is that *Grainswest* could set up a subsidised research services business that would unfairly compete with them to provide contract field and analytical research services. This could ultimately lead to the demise of these companies and a net loss of capacity servicing the grains industry.

**Imperative 9:**

*Grainswest PLUS* should not compete with services that can be provided by the commercial sector and other organisations that could result in a net loss of capacity servicing the industry.
10. Research stations and infrastructure

An integral part of the Grainswest PLUS business will continue to be the conduct of multiple field R&D trials. Whilst the majority of trials can be conducted on leased land on commercial farms there will be a number of trials that are best suited for biosecurity, disease management and post-trial rehabilitation reasons to being conducted on dedicated research stations. DAFWA has in the past or currently uses the following research stations for grains industry research:

- Esperance Downs
- Merredin
- Wongan Hills
- Badgingarra
- Katanning
- Mt Barker
- Newdagate

GIG considers it would be a major boost to the industry support for Grainswest PLUS if these assets could be transferred into a trust with the assets managed by Grainswest PLUS to continue to service the grains industry and other agricultural industry research needs. The trust should have the flexibility to be able to rationalise these assets through leasing, selling and buying land assets as required to service the needs of the industry. There should be access arrangements for DAFWA and other deliverers of agricultural R&D services to use these facilities.

GIG observed that GRDC and industry were much more likely to invest in and use facilities of these research stations if there was certainty that these would remain in industry control and not be subject to closure and sell off by Government. GIG observed the resurgence of the IA Watson Grains Research Centre at Narrabri where the land is owned by a farmer trust and it is operated by the University of Sydney with 12 entities using the site and the Temora Research Centre (now known as the Temora Agricultural Innovation Centre) managed by a grower group Farmlink Research Limited with 16 entities using the site, that have flourished where ownership was placed in a trust with industry or local government.

Likewise there will be research infrastructure, including plant and equipment, currently used by DAFWA for grain farm production research that should be transferred to Grainswest PLUS or the trust with the ability to sell and dispose of plant and equipment not required.

GIG believes it would be a major step in guaranteeing ongoing infrastructure for the industry if the Government was to use (for example) Royalties for Regions funding to purchase these assets from the WA Government and transfer them into a trust managed by Grainswest PLUS.

Recommendation 10:

An independently controlled trust is established to acquire the existing Research Stations and other infrastructure, plant and equipment used by the Grains Industry and place these under management for the long term benefit of the grains industry.

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5 Not all of each research station is necessarily used for grains research, some land is used for other research activities and if not needed is used for commercial cropping or livestock production, or is leased out.
Key differences of the *Grainswest PLUS* model

The table below shows the key differences these recommendations would make in the operation of *Grainswest PLUS* compared to the *Grainswest* model as proposed by DAFWA, and the current arrangements in DAFWA.

<table>
<thead>
<tr>
<th>Comparison of current DAFWA delivery model and proposed <em>Grainswest</em> and <em>Grainswest PLUS</em> models</th>
<th>DAFWA Grains R&amp;D</th>
<th><em>Grainswest</em></th>
<th><em>Grainswest PLUS</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope/focus</strong></td>
<td>All grains R&amp;D</td>
<td>“Carve out” of existing projects in Agronomy, Soil productivity, Crop Protection, Genetic Improvement and Farm Business Integration</td>
<td>Demand based build Farming and cropping systems, agronomy (including phenotyping), crop protection and soil productivity. Avoid competing with commercial companies and other R&amp;D delivery organisations</td>
</tr>
<tr>
<td><strong>Legal structure</strong></td>
<td>Government Department</td>
<td>Not for profit company limited by guarantee</td>
<td>Not for profit company limited by guarantee</td>
</tr>
<tr>
<td><strong>Membership/Partners</strong></td>
<td>Minister for Agriculture and Food</td>
<td>DAFWA - others by approval of DAFWA.</td>
<td>DAFWA and GRDC. Others by approval of members.</td>
</tr>
<tr>
<td><strong>Board</strong></td>
<td>None</td>
<td>Skills based board appointed by members and then adding directors by existing directors</td>
<td>Independent panel to appoint a skills based board with an independent chair the inclusion of grower and commercial experience</td>
</tr>
<tr>
<td><strong>Financial commitment</strong></td>
<td>Determined by DAFWA and Minister’s priorities within State Government’s four year DAFWA Budget projections and funding committed by GRDC for projects</td>
<td>A five year commitment from the State Government until 2020 and then subject to negotiation.</td>
<td>Rolling five-year commitment from State Government and other partners to establish and maintain capacity.</td>
</tr>
<tr>
<td><strong>Start-up projects</strong></td>
<td>Not applicable</td>
<td>All current 60 GRDC funded projects with DAFWA novated across</td>
<td>Selected GRDC funded projects novated across with some projects going to other delivery organisations or remaining in DAFWA until completion.</td>
</tr>
<tr>
<td><strong>Staffing</strong></td>
<td>195 staff</td>
<td>“Carve out” of approximately 150 research and technical staff and 20 management and administration staff.</td>
<td>Build of staffing based on capacity demand assessment and the GRDC projects novated across after a review of relevance</td>
</tr>
<tr>
<td><strong>Location of the company</strong></td>
<td>DAFWA South Perth campus with regional based staff</td>
<td>DAFWA Northam Office with staff based in other regions</td>
<td>Perth Node with strong regional focus based on project needs</td>
</tr>
<tr>
<td><strong>Research stations and other research infrastructure</strong></td>
<td>Owned and managed by DAFWA with some leasing out of unused land</td>
<td>Access to DAFWA owned infrastructure to <em>Grainswest</em> by way of leases and use agreements</td>
<td>Assets transferred to <em>Grainswest PLUS</em> trust paid for by Royalties for Regions.</td>
</tr>
</tbody>
</table>
Transition to Grainswest Plus

The scope of this study did not include mapping out the orderly transition from DAFWA to Grainswest PLUS. This is the function of the members of Grainswest PLUS and the board once the final design criteria of Grainswest PLUS have been set and a business plan completed. However, three key transition issues stand out for GIG and lessons from the study of start-ups for similar entities:

- Financing the transition;
- The involvement of the universities and CSIRO; and
- Human resources management.

Financing the transition will require additional funding in the first year as new structures are put in place and new infrastructure is established. If staff transferring to another organisation are to be no worse off this may require salary top ups for a period to ensure equity. Accommodation may need to be built or re-furbished and this all takes time and money. Adequate funding is essential if the transition is to be as rapid and as smooth as possible.

The role of the universities and CSIRO in Grainswest PLUS will require further discussions with these organisations. This could range from them ultimately joining Grainswest PLUS as members or the development of collaborative mechanisms and the provision of services to Grainswest PLUS on a contractual basis or as part of joint project teams.

The staffing of Grainswest PLUS is likely to be built over a period of one to two years and there is a need for open and clear communication with DAFWA staff and the unions involved on the processes for staff moving across to Grainswest PLUS and the processes for those staff remaining in DAFWA or those invited to move to other organisations. While secondments for some staff may be necessary in the first year, or possibly two, the experience of other start-ups is that the faster the transition of staff to their new organisations the faster the new model will settle down and be focused on effectively delivering the desired outcome.
Collaboration in agricultural R&D in WA

The establishment of Grainswest PLUS will go a long way to filling the gap left by the retreat by DAFWA from delivering grain farm production R&D but it is not going to deliver all of the grain farm production RD & E in WA. There will be many other organisations that will continue to deliver to the industry: CSIRO; other universities, the life science and input supply companies; contract research service providers, grower groups; agricultural consultants and growers themselves.

GIG recognises that there is a need to ensure collaboration between the various organisations involved in agricultural R&D in WA. GIG believes this could be achieved through regular fora to ensure collaboration between the organisations involved in agricultural R&D, including grain farm production R&D. The WA Marine Science Institution and the WA Energy Resource Alliance provide examples where a modest investment by the State Government has an important role in fostering collaboration and efficient R&D delivery. These are essentially unincorporated joint ventures with all the research deliverers in that field coming together to collaborate on projects and share infrastructure and are viewed as helping to ensure priority industry and government needs are met. GIG also notes that the pro vice chancellors for research at the five WA universities meet regularly to share plans and ideas on sharing infrastructure across all of their areas of research.

In parallel with this collaborative mechanism for the whole of the agricultural sector it is recommended that the GRDC and the State Government invest in funding a collaboration network with at least annual or six monthly forums for the parties involved in grain farm production RD & E in WA to share plans and encourage collaboration and sharing infrastructure and avoid duplication by focusing on areas of specialisation. The structure does not need to be set up in a formal way as an unincorporated joint venture. It can just be established through leadership and goodwill of all involved. It would also be an important link into the National Grains RD & E Strategy.

The collaboration mechanism should include all the funders and deliverers of RD&E to the grains industry, including representatives of commercial companies, grower organisations, grower groups and the agricultural consultants and agronomists.

**Recommendation 11:**

The Minister for Agriculture and Food should establish an Agricultural Research and Development Alliance with the aim of fostering collaboration and planning for the R&D capacity to meet the needs of the WA agricultural sector. This should include a WA grains R&D network.

Strategic planning for agricultural R&D in WA

The WA grains industry accounts for over 50% of the Gross Value of Agricultural Production in the State. Accordingly, the ongoing effective delivery of R&D is vital to the grains industry, but so it is to the whole agricultural sector.

GIG believes there is a lack of an overall clear vision of what R&D infrastructure and processes are needed to support the agricultural sector in WA to achieve its maximum potential as a source of economic growth and export earnings for the State. GIG would support the Chief Scientist and the office of Science working with the Minister for Agriculture and food to develop a “Vison Agriculture” and effectively map out what agriculture will look like in 2050 and what it will need in by way of information, skills and capacity and infrastructure.
**Recommendation 12:**

GIG supports the Chief Scientist and the Minister for Agriculture and Food developing a “Vision Agriculture” to drive the planning for agricultural research and development capacity in Western Australia in the future.
Attachment A: Background

The Grains Industry Group

The Grains Industry Group (GIG) is a representative group of grains industry members from key grains industry bodies that have come together for the sole purpose of commissioning a review into optimum model(s) for grain production Research and Development (R&D) in WA.

Industry consultant David Falconer called an open meeting of all parties with an interest in WA grains industry R&D, soon after the Department of Agriculture and Food, Western Australia (DAFWA) budget forecasts were announced in June 2015 and at the same time DAFWA revealed plans to move its grain farm production research and technical staff into a not for profit company limited by guarantee called Grainswest. A total of 37 people attended this meeting in August 2015 and from that, identified membership of a ‘working group’ that would act under the title of Grains Industry Group (GIG), to undertake the agreed research and recommendation activity.

The GIG is a temporary grouping of representatives from key grains industry bodies. By bringing the GIG together in this way, there is a clear mechanism for efficient engagement with (but no obligation to) every representative entity that has a stake in grains industry R&D. Currently, no umbrella organisation exists that fully represents each entity and so its temporary collective fills a market place communication and engagement gap.

GIG members and the entities they represent have a view that the extensive work done by DAFWA to form the Government-proposed model for grains production R&D (known as Grainswest) had been developed without sufficient industry input. GIG is unanimous in its position that transformational change requires thorough consultation and engagement with industry (such as is occurring now via GIG); and evidence that alternative structures had been examined, should be a precursor to proceeding with the development of a new model.

The GIG working group that oversaw this study comprised:

- David Falconer Chair/Australian Association of Agricultural Consultants (WA Inc.)
- ClancyMichael Vice Chair/ Grower Group Alliance
- Ashley Bacon Kalyx (representing commercial contract R&D service provider)
- Doug Clarke WA Grains Group
- Sean Powell Grain Industry Association of Western Australia Inc.
- Ian Randles Pastoralists and Graziers Association
- Michael Roberston Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- Graeme Wright Curtin University (representing all WA universities)
- Duncan Young WA Farmers

Scope of the Study

The GIG study reviewed the key strengths and opportunities and the key risks and threats of various options (operating models relevant to the delivery of grain farm production R&D in WA) and what success will look like in 5-10 years’ time for the sustainable delivery of grain farm production R&D in WA. The objective of the report is to recommend an industry preferred option for the future delivery of grain farm production R&D in WA. For clarity the transition plan, transition risk and proposed mitigation plans of the preferred option are not part of this Study.
The work program for this study comprised the following steps:

1. Articulate the growers and industry’s requirements and underlying principles for the best future delivery model for on farm productivity research in WA.

2. Articulate funders (both cash and in-kind) and future user requirements for the future model and the future role of current delivery entities involved in grain farm production R&D in WA.

3. Desk top review of existing reports and current work underway which examine delivery models for agricultural and grain farm production R&D that provide insights into the different models operating in Australia and overseas that could have application for the delivery of grain farm production R&D in WA.

4. Review alternative Australian delivery models for grain and agricultural production R&D for principles to apply for the future model in WA. This review to be based on a desk top review, complemented by selected interviews to ascertain: ownership structure, assets, funding, areas of R&D, priority setting and delivery mechanisms.

5. Review alternative R&D delivery models operating in other fields in WA and industries for lessons for grain farm production R&D, including but not limited to example organisations in the fields of: medical; oil and gas industry; mining; and, marine and fisheries.

6. Direct input from in-country commentators on selected relevant models operating overseas identified in the desk top review.

7. Interviews with other providers of grain farm production R&D operating in WA to establish if a gap will exist in the future and therefore the role and focus for any replacement entity for grain farm production R&D services currently provided by DAFWA.

8. Compare the Grainswest model, as currently envisaged by DAFWA, against the design features that would be desirable based on the lessons from studying other sustainable models selected as relevant to delivering grain farm production R&D practiced elsewhere in Australia and overseas.

Bluesee through a sub contracted consultant (Ian Longson) and an expert panel (comprising Dr Clive Noble, Dr Keith Steele and Mick Poole) facilitated the GIG’s study of the optional structures and models and the production of this report. The work comprised desk top research, comprehensive interviews with organisations selected as models to study, and an extended in-person meeting with the expert panel. This was followed by a workshop with GIG to prepare the report based on the information collected to identify the key strengths and opportunities and the key risks and threats of various options for the sustainable delivery of grain farm production R&D in WA and to recommend a preferred option or options. GIG is grateful to Bluesee and its consultant team for conducting the background research which enabled GIG to deliver this report outlining the key strengths and opportunities, and the key risks and threats, of various options with a five-10 year timeframe for the sustainable delivery of grains production R&D in WA.

GIG gratefully acknowledges the financial support of both the Grains Research and Development Corporation (GRDC) and DAFWA in funding this study.
Funding of Grains R&D in Western Australia

The Grains Industry National RD&E Strategy

The Grains Industry National RD&E Strategy, established in 2011, is aimed at building a more coordinated and collaborative approach to Australia’s RD&E activities across public and private sector organisations focused on areas of industry priority.

The framework recognises a continuum extending from research (R) through development (D) to extension (E) of regionally interpreted and validated research (see Attachment A).

It has no legal status, but is established under a Letter of Intent signed by the contributing parties including the Australian Council of the Deans of Agriculture (the Universities), the Federal Department of Agriculture and Water, the State departments responsible for agriculture, the CSIRO and the Rural Research and Development Corporations with the intent of the parties “to enhance the collaboration, coordination, efficiency and effectiveness of RD&E efforts nationally”. In recent years the aim has been to include the industry with Grain Trade Australia, the National Agribusiness Reference Group, the Cereal Breeders Alliance, CropLife Australia and Grain Producers Australia joining the implementation discussions.

It is monitored through the Agriculture Senior Officials Committee (AGSOC) and aims to keep in place a forward-looking national plan to secure the intellectual and human capital and physical resources required to underpin future RD&E and industry innovation through:

- National Research Programs to create critical mass and avoid unnecessary duplication that will address national priorities and deliver national and regional outcomes.
- National Centres of Research Capability to maintain critical infrastructure and critical science disciplines, and to establish links to access international research collaboration.
- Regional Centres of Applied RD&E that support farming systems, improved practices, and adoption of national research outcomes.
- Long-term bilateral arrangements between host organisations and the GRDC to stabilise funding and enhance the career pathways for science staff.
- A skills pipeline to develop a suitable workforce for the future grains industry.

DAFWA plays a major role in the Strategy, providing national leadership and financial support to the implementation committee, ensuring the State is well positioned to build on collaborative processes to optimise benefits to the grains industry. The National Grains RD&E Implementation Committee meet twice a year in person and have additional meetings by teleconference to share information on investments and adjust priorities. The Implementation Committee is jointly chaired by John Harvey, Managing Director of GRDC, and Dr Mark Sweetingham, Executive Director with DAFWA responsible for grains R&D.

During 2013-14 total expenditure on grains RD&E in Australia was an estimated $476 million. Based on an average annual gross value of production (GVP) of $11 billion, this represented 4.3% of GVP. Investment by State departments was reportedly declining compared to 2007-08 estimates.

The Grains Industry National RD &E strategy informs the investment in the grain farm production R&D in WA by the GRDC and DAFWA.
The Grains Research and Development Corporation

The Grains Research and Development Corporation (GRDC) is by far the largest funder of grains RD&E in Australia and WA. Total investment in RD&E in 2014-15 was $194 million of which $75 million was allocated to the Western Region (synonymous with the State of WA). This does not mean that $75 million is delivered through WA entities but it is a nominal allocation based on the actual expenditure through WA delivery entities and a proportion of national research programs of value to the WA grains industry.

GRDC’s major stakeholders are Australian grain growers and the Australian Government. Funded by grain growers who pay a 1% levy, of which half is matched by government funds up to 0.5% of the gross value of grain production at the farm-gate. In 2014-15 the Australian Government contribution was $68 million. The Australian Government requirements are based on the National Rural Research and Development priorities.6 Discussions are held between GRDC management and the federal Department of Agriculture and Water Resources throughout the year to determine how best GRDC can meet these requirements.

The GRDC has well defined investment and priority setting processes. It has a framework for investments based on time to achieve the desired outcomes:

1-3 years  Regional validation and adoption - local R&D projects - addressing immediate local issues and often involving validation demonstration field trials and extension for adapting research work done elsewhere to local growing conditions to encourage adoption. (Approximately 20% of annual funding)

3-8 years  Development - Regional and statewide applied research and translation of research on issues of widespread application (e.g. frost management, nematodes) requiring a focused effort from a multidisciplinary research team. (Approximately 40% of annual funding)

8+ years  Discovery - Long term strategic research with Australian and international research partners and regional validation with major potential for Australian Grains Industry. (Approximately 40% of annual funding)

Investment priorities are informed by WA growers through the Regional Cropping Solutions Network (RCSN) operated by the GRDC, which comprises some 60 people, mainly growers, from across the 5 port zones in the WA grainbelt. The RCSN provides essential on ground linkages between growers, farming systems groups, agribusiness and researchers and complements the National Grains Industry RD & E Strategy to better plan and design local activities of greatest benefit. The GRDC’s RCSNs play an important role in validating priorities determined by the Western Panel and identifying the top issues affecting local growers to develop short-term projects with the aim of overcoming barriers and creating the desired practice change. ‘Open RCSN meetings’ held for growers (in 2015 over 200 growers attended these meetings) immediately prior to meetings of the 5 RCSN port zone groups and the Western Panel are used to highlight specific, highly local, production issues, and vote on in order to rank their level of importance.

These regional priorities are reviewed and informed by the Western Panel, a group of growers and industry professionals appointed by the GRDC to develop priorities for the Western Region (WA).

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The Department of Agriculture and Food, Western Australia (DAFWA)

The WA State Government makes an annual budget allocation to the Department of Agriculture and Food (DAFWA). DAFWA has provided forward estimates of its total appropriations from the State Government for its activities that indicate a declining budget situation, which continues a trend in recent years.

- 2013-14 (actual) $146 million
- 2014-15 (estimated) $136 million
- 2015-16 (budget) $122 million
- 2016-17 (forward estimate) $123 million
- 2017-18 (forward estimate) $121 million
- 2018-19 (forward estimate) $119 million

In addition there is a capital replacement program for laboratory and field research equipment that is typically around $500,000 to $1 million per year from grains R&D.

During 2014 and 2015 DAFWA was awarded management of three Royalties for Regions projects relevant to grain farm production R&D:

- $20 million over 4 years for the Boosting Grains R&D Initiative which included funding to establish a new grains R&D entity.
- $10 million over 4 years for the e-Connected grainbelt project.
- $17 million over 2 years for grower groups to support applied R&D

Universities

Universities have an important role in funding RD&E with the Australian Government providing a total $2.8 billion through Research Block Grants and the Australian Research Council to Australian Universities. It has not been possible during this study to establish exactly how much of this can be tracked through to funding for grain farm production R&D through the four universities operating in WA (University of Western Australia, Murdoch, Curtin and Edith Cowan Universities).

An important point to note is that the current formulae for allocating Federal Government funding to Universities are focused on allocating research funding based on rewarding research excellence, as measured by published research in recognised journals and postgraduate student numbers. The new National Science and Innovation Strategy announced by the Prime Minister during December 2015 is aiming to shift the focus of University research to demonstrating impact and partnerships with industry. Whilst it is likely to be a few years before this change in priorities has a significant impact, it could be expected to lead to greater investment of University resources directed to R&D of relevance to the WA (grains) industry and an incentive for universities to be involved with GrainsWest PLUS.

Other funders

Other funders of grains R&D in WA include the CSIRO, COGGO Limited, the life science companies and input supply companies, grower groups and farmers (the latter two by way of in kind contribution of their time, infrastructure and materials).

CSIRO, which receives an annual allocation of $700 million from the Federal Government, has also received signals in the National Science and Innovation and Strategy that the Government expects greater emphasis on partnering with industry.
COGGO Limited, a voluntary grower funded WA research fund, provides around $500,000 per annum in research funding for local innovative grain farm production R&D projects in WA. However, its funding base is declining as membership falls in line with the reduction in the number of grain farm businesses in WA through consolidation.

Funding through the life science companies and other sources is stable or declining as further consolidations are taking place in these sectors of the industry and funding is tending towards investments in technology and data management systems and services.

**Current Grain Farm Production R&D Delivery in WA**

The main current deliverers of grain farm production R&D in WA were interviewed to ascertain their current activities and plans for future delivery capacity.

**The Department of Agriculture and Food, Western Australia (DAFWA)**

The Department of Agriculture and Food, Western Australia (DAFWA) operated with a Grains Industry Directorate up until September 2015 when it was split with approximately 90 staff involved in grains policy and industry development activities, including regional services functions in the Central Agricultural Region, transferred into the Grains and Livestock Industries directorate. At the same time the Grains R&D Transformation directorate was set up with around 195 researchers, technical staff, management and administration personnel.

DAFWA is by far the largest employer and provider of grain farm production R&D in WA. As at February 2016 the staff positions were distributed as follows: 30% of the 195 Grains R&D Transformation directorate staff are based at South Perth, 26% at Northam, 125 at Geraldton, 10% at Merredin and 7-8% at Albany and Esperance with the rest based at regional offices and research stations. This includes unfilled staff positions unable to be filled due to the state Government employment freeze. A head count of full time equivalents conducted in late 2015 revealed the following distribution of staff resources:

<table>
<thead>
<tr>
<th>Location</th>
<th>Full time equivalent staff allocated to Grains R&amp;D Transformational Directorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany office</td>
<td>10.2</td>
</tr>
<tr>
<td>Esperance Downs Research Facility</td>
<td>3.3</td>
</tr>
<tr>
<td>Esperance office</td>
<td>8.0</td>
</tr>
<tr>
<td>Geraldton office</td>
<td>19.0</td>
</tr>
<tr>
<td>Geraldton technical support</td>
<td>2.0</td>
</tr>
<tr>
<td>Katanning office</td>
<td>4.6</td>
</tr>
<tr>
<td>Merredin office</td>
<td>10.5</td>
</tr>
<tr>
<td>Merredin Research Facility</td>
<td>3.0</td>
</tr>
<tr>
<td>Moora office</td>
<td>0.3</td>
</tr>
<tr>
<td>Murdoch University</td>
<td>3.6</td>
</tr>
<tr>
<td>Narrogin office</td>
<td>1.5</td>
</tr>
<tr>
<td>Northam office</td>
<td>33.7</td>
</tr>
<tr>
<td>South Perth</td>
<td>71.0*</td>
</tr>
<tr>
<td>Wongan Hills Research facility</td>
<td>2.8</td>
</tr>
</tbody>
</table>

* includes 23 FTE positions to be assigned to Northam or Murdoch
DAFWA advised that obtaining State Government Consolidated expenditure data for 2014-15 and 2015-16 for the then Grains Directorate would not provide a true picture for the Grains R&D Transformational Directorate forward budgets as the Directorate was split in September 2015 when 90 staff were transferred out of the then Grains Directorate and deployed into either the Grains and Livestock Directorate or the Grains R&D Transformational Directorate.

The State Government (Consolidated) Funds for the Grains R&D Transformational Directorate for 2016-17, which assumes the first year operation of the proposed Grainswest with the ‘carve out’ of 195 staff, is shown in the table below together with the budget estimate for 2017-18.

<table>
<thead>
<tr>
<th></th>
<th>2016-17 ($m)</th>
<th>2017-18 ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries (including on costs)</td>
<td>12.4</td>
<td>12.7</td>
</tr>
<tr>
<td>Operating</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Corporate Overhead</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Start-up costs</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>22.6</strong></td>
<td><strong>20.5</strong></td>
</tr>
</tbody>
</table>

It is important to note that salaries shown here do not include superannuation payments. These are accounted for in the Corporate Overhead. However, salaries do include some significant corporate services charges. This makes it difficult to compare the individual cost items with traditional charts of accounts for commercial organisations.

Budgets for external funding and Royalties for Regions project funding are shown in the table below. By far the majority of external funds come from the GRDC.

<table>
<thead>
<tr>
<th></th>
<th>2014-15 ($m)</th>
<th>2015-16 ($m)</th>
<th>2016-17 ($m)</th>
<th>2017-18 ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>11.5</td>
<td>10.9</td>
<td>9.6</td>
<td>8.4</td>
</tr>
<tr>
<td>Operating</td>
<td>7.3</td>
<td>15.2</td>
<td>10.4</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18.8</strong></td>
<td><strong>26.1</strong></td>
<td><strong>20.0</strong></td>
<td><strong>17.0</strong></td>
</tr>
<tr>
<td><strong>Royalties for Regions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>0.6</td>
<td>1.5</td>
<td>1.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Operating</td>
<td>0.8</td>
<td>6.2</td>
<td>5.8</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.4</strong></td>
<td><strong>7.7</strong></td>
<td><strong>7.7</strong></td>
<td><strong>6.6</strong></td>
</tr>
</tbody>
</table>

The largest funder of DAFWA grains R&D is the GRDC. During March 2015 the budget for funding from the GRDC for the 61 GRDC funded projects in 2015-16 was broken up as follows. The areas of expenditure (in descending order of size of GRDC investment) were:
- Soils productivity $4.6 million
- Agronomy $4.5 million
- Crop protection $3.6 million
- Farm business integration $2.9 million (for “diagnostic and responsive agronomy tools”)
- Crop genetics $2.2 million
- Field services $0.8 million

This gives a first pass overview of the types of GRDC funded projects that DAFWA is engaged in and the relative expenditures between the areas of specialisation.

CSIRO

The CSIRO is the largest individual supplier of rural R&D in Australia. About 60% of CSIRO’s funding for agriculture and food-related R&D comes from Commonwealth block grants, with the remainder from contestable sources (of which around a quarter is from the RDCs). It’s activities in grain production R&D of direct relevance to the WA Grains Industry are arguably greater than the combined level of University activity in WA.

In terms of its future role in support of grain farm production R&D CSIRO remains committed to research orientated on the export grain sector in WA and made the following points:

- Their presence is likely to grow modestly over the next five to 10 years (e.g. from 50 to 60 FTEs based in WA plus another 15 FTEs based outside the State). Around 80% of staff time from these personnel is directly relevant to R&D the grains industry. Most of this is GRDC-funded on a co-investment basis and amounts to around $5 million per annum of CSIRO investment matched by GRDC funding of the same order.
- Their focus will remain on novel agronomy, farming systems (including the role of forages and livestock), overcoming soil constraints, crop nutrition and fertiliser management, crop adaptation.
- Work will continue outside of WA that is relevant to the State, such as crop pre-breeding (including for disease resistance), digital technologies such as robotics, automation, precision agriculture, and telecommunications.
- Any work on pest, disease, or weed problems will have a focus around novel management interventions and the role of products like biologics.
- They will be striving to diversify their funding base away from almost sole reliance on GRDC towards more funding from the multinational bioscience companies and other players in private industry.
- They will continue to draw in capability from outside WA where it makes sense.
- They will continue to view themselves as a strategic applied science organisation, keen to collaborate with players further downstream and upstream.

Universities

The universities, along with CSIRO, have historically been the main providers of strategic rural research, seeking to add to the knowledge base, rather than targeting specific applications.

There are five universities in WA. The University of Western Australia has traditionally been the main WA university servicing the agricultural sector and remains the highest ranked WA university in terms of agricultural research output. Second is Murdoch University with its focus on veterinary science and
agricultural biotechnology and then Curtin University with a strong historical focus on agribusiness research. Edith Cowan University does not specifically focus on grain farm production R&D but it has a few projects of relevance including a GRDC project for photonic detection using lasers to detect weeds in crops using sensor bars able to operate at high speeds and houses the Pilot Malting Plant used to evaluate barley varieties for malting purposes as well as train maltsters and brewers. The fifth university in WA (Notre Dame University) does not claim or aspire to have an interest in grain farm production R&D.

The University of Western Australia

The University of Western Australia (UWA) operates its agricultural research through its Institute of Agriculture which aims to enhance the University’s contribution to the advancement of agriculture and the management of natural resources in selected international, national and regional settings. UWA prides itself on its strong focus on the basic sciences and makes no apologies for its apparent international focus aiming to address local problems in an international context. The Institute has five research programs: integrated land and water management; plant production systems; animal production systems; rural economy, policy and development; and, education, outreach and technology exchange.

UWA also houses the Australian Herbicide Resistance Initiative (AHRI) which is regarded as the research leader in herbicide resistance and its management in cropping systems in Australia and has a strong international reputation and linkages. Established in 1998 by a substantial investment by the GRDC and housed at UWA, AHRI has no legal structure other than as a project in the School of Plant Biology. There are 20 FTE, 17 (including three PhD students) based at UWA and agronomist/communicators based at Geraldton, Toowoomba and Wagga Wagga.

UWA does not see its focus on agriculture waning, but rather increasing. It aims at having strengths in basic sciences and then applying these to agricultural production, especially in the areas of soil science and plant science with expertise in soil chemistry, soil physics, geology, mineralogy, microbiology, wheat genetics and crop physiology. UWA sees one of its main strengths as being in abiotic stress-related research, such as drought, heat and salinity resistance and genomic approaches for stress tolerant crops. Biotic stress related research which aims to improve disease resistance in crop plants was also a key focus of research. There is also a strong agricultural and environmental economics and policy sustainability focus.

Murdoch University

Murdoch University is committed to translational research in four key areas: primary food production; climate variation and adaptation, environmental and natural resources; animal and human health and welfare; and, social sciences including public policy, governance, communication, culture and education. It does not see its role diminishing in agricultural R&D in the future through its areas of strength.

Murdoch University has particular strengths in Veterinary Science and animal production research and Agricultural Biotechnology. Murdoch houses the State Agricultural Biotechnology Centre (SABC). The SABC is the collaborative university Centre for R&D in agricultural and veterinary biotechnology in WA. It provides platform technologies and world class equipment and facilities for R&D in agricultural biotechnology to researchers from universities, State government and industry. At any time 15-20 research groups and companies rent space and use the SABC facilities. The SABC has extensive Physical Containment Level 2 (PC2) and Federal Department of Agriculture and Water Resources Biosecurity
containment facilities, including bench space for 88 full-time researchers located in three large laboratories and DAFWA Biotechnology Services Laboratories.

Another major focus of Murdoch University of relevance to the WA grains industry is the Centre for Rhizobium Studies (CRS). Since its inception during 1997, the CRS has become an internationally-recognised hub for research and training in the science of the root nodule bacteria.

The University is also a node for the Plant Biosecurity CRC. Grains investment in the CRC’s programs across Australia totalled $53.8 million (40% of total investments), of which $33.5 million was for management of pests in stored grain.

Curtin University

Curtin has a long track record of involvement in Agricultural teaching and research. However, its activities have changed rapidly over recent years and they have been strengthened through the focussed use of internal and external investment. From 2011 Curtin’s Muresk Institute transitioned to become the Department of Environment and Agriculture (School of Science). During this transition the Bachelor of Agribusiness was maintained as a core undergraduate offering and research capacity was developed within agreed areas of strength as defined by the National R, D &E framework. The research focus has underpinned rapid growth in the area of crop and pasture science and Curtin has recently been ranked as ‘well above’ world standard (ERA 5) in this area.

In 2010 Curtin established the International Institute for Agri-Food Security involving over 55 academic staff from all 4 faculties. Curtin has field sites that it can use at Margaret River and Muresk. In 2014 Curtin and GRDC signed the first of the bilateral research agreements with GRDC and an externally-funded research centre – Centre for Crop and Disease Management (CCDM) was formed to house much of the research activity (see details below).

Curtin University has interests in the following areas:

- Crop diseases
- Pre-breeding - crop genetics, physiology, molecular breeding and genomics
- Agronomy
- Farming systems
- Crop prediction models (for disease)
- Farm business management
- Application of new technology (ag machinery, telecommunications, robotics, big data, telemetry)
- Climate modelling including access to ClimSim and PlantGrow models, WARRF (impacts of tropical cyclones and landslide modelling)
- Post-harvest horticulture
- Aquaculture
- Grain food product development (lupin, sorghum, oat and wheat)
- Statistical and large scale data linkage (precision agriculture)
- Engineering (robotics, design)
- Water use efficiency and crop stress physiology in vines and broadacre crops.

In 2014 Curtin and GRDC signed the first of the bilateral research agreements with GRDC and an externally-funded research centre – the Centre for Crop and Disease Management (CCDM). The CCDM is a highly flexible construct which provides the delivery mechanism for the GRDC/Curtin bilateral
agreement under the National R, D & E Framework to focus on research of cereal and pulse diseases and management in grain farming systems.

**Commercial life science and input supply companies**

The large multinational life science companies such as Bayer and Monsanto have small teams based in WA and most of their R&D is done outside Australia and work in Australia is largely validation “Development” work. These companies conduct field trials in WA, largely using contract research providers, grower groups and with their own staff doing the observations and assessments during the trial. They are not expected to ramp up demand for local R&D services in WA significantly in the next decade and further consolidation is expected amongst the life science companies. The life science companies are also tending to move their investment focus towards technology and data management systems and services and away from just providing seeds, chemicals and fertilisers.

The two major crop breeding companies operating in WA, Australian Grain Technologies (AGT) and Intergrain have their own dedicated facilities supporting their crop breeding activities.

The overriding conclusion is that the demand from commercial life science and input supply companies for any shared infrastructure in WA is likely to be modest. There may be opportunities to involve companies co-investing on a project basis. There is a demand for increased access to shared controlled environment growth rooms in WA from at least one of the breeding companies.

**Contract research providers**

Private research service providers such as Kalyx, Eurofins and Living Farm run efficient and effective services for putting in and harvesting crop field trials and providing most analytical laboratory services associated with grain farm production R&D trials. They are extensively used by researchers operating in public and private institutions to put in field trials.

The contract research providers contacted in this study envisaged increased roles in grain farm production R&D delivery in the future and this increased capacity needs to be taken into account. They tended to be self-contained in the provision of their own infrastructure and there is expected to be limited demand from this sector for shared infrastructure.

GIG believes that an important design principle for *Grainswest PLUS* is that it should not be involved in the provision of any field, laboratory or extension services that are already provided by the private sector and where reasonable competition exists to ensure transparent and fair pricing.

**Grower groups**

There are 42 grower groups within the Grower Group Alliance (GGA) network in WA, with a combined grower membership of more than 3,000 (this doesn’t take into account growers being members of more than one group). Groups in the GGA network cover an area from Binnu in the north and Southern Cross in the East, down to Esperance in the South East; and cover the majority of the broadacre cropping and livestock region.

Grower groups’ strengths are in development and extension. Grower groups will continue to be a key deliverer of extension to grain growers, but they believe they will need to consider alternative business models, such as fee for service, to remain sustainable in a changing RD&E environment.

Grower groups in WA are mainly small groups with one-three staff, with mainly part-time employees and volunteer input. There are exceptions with Western Australian No Tillage Farming Association
(WANTFA), the South East Premium Wheat Growers’ Association (SEPWA), the Liebe Group, the Mingenew Irwin Group and the West Midlands Group being the largest and having around 6 staff each, with agronomy and research skills. It is considered that alliances between groups could provide the critical mass to increase the employment of qualified research/demonstration and technical staff and the infrastructure to take on more grain farm production R&D projects in the future.

In the future, grower groups believe there will be more demand on their services as the public sector retreats from funding R&D, particularly around delivering more RD&E projects and activities and becoming a training ground for new graduates. Groups are keen to take on this new challenge and roles within the industry.

In any event, grower groups are expected to remain involved in local ‘small D’ and extension activities and they need to be closely aligned with any new R&D delivery entity to ensure an efficient and effective continuum between RD&E.

**Agricultural consultants and agronomists**

It is estimated that over 50% of grain growers in the State have at least one agricultural consultant or agronomist adviser, and the larger growers commonly have 3 or 4 specialist advisers. Agricultural consultants and agronomists have a very large part to play in extension and some are engaged as scientific advisers to grower groups and/or in the provision of R&D services. Most agricultural consultants and agronomists servicing the grains industry belong to the Australian Association of Agricultural Consultants (WA) Incorporated (AAAC WA).
Attachment B: Definitions of Research, Development and Extension

The National Research, Development and Extension Strategy framework initiated during 2011 provided a dynamic framework enabling government and industry to work collaboratively in securing the future profitability of the Australian Grains Industry. The framework recognised a continuum extending from research (R) through experimental development (D) to extension (E) of regionally interpreted and validated research.

Research (R)

Encompasses the following definitions adopted by the Australian Productivity Commission:

- Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application of use in view.
- Applied research is also original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Development (D)

Application of knowledge gained through basic and applied research to create new or improved materials, products, processes and services, commonly through partnerships with commercial entities in the supply chain. By definition, a significant proportion of D must occur at regional or local level.

Extension (E)

Field of communication, information exchange and promotion of learning in order to build capability and change practice. It includes a wide range of communication and promotion tools and activities, and encompasses the roles of advisory or consultant services, field days, update events and electronic delivery. Extension includes the development of practice change methods required to achieve high levels of adoption of research outcomes and new technologies. It is recognised that these tools and delivery mechanisms will by nature be diverse and vary according to the intended outcome sought, the target segment of the industry and the local situation.
Attachment C: Alternative Delivery Structures and Models for Research and Development

The following R&D structures and models were reviewed as part of the study for the future delivery of grain farm production research and development in WA.

Western Australia

- Australian Herbicide Resistance Initiative (AHRI)
- Centre for Crop and Disease Management, Curtin University
- Western Australian Marine Science Institution (WAMSI)
- The Indian Ocean Marine Research Centre (IOMRC)
- Harry Perkins Institute of Medical Research
- Western Dairy
- Minerals Research Institute of Western Australia
- Western Australian Energy Resource Alliance
- Department of Fisheries, WA Research Division

South Australia

- South Australian Research and Development Institute (SARDI)
- The WAITE Research Precinct, Adelaide
- Tasmania
- Tasmanian Institute of Agriculture (TIA)

Queensland

- The Queensland Alliance for Agriculture and Food Innovation
- The Institute for Agriculture and the Environment, University of Southern Queensland

New South Wales

- Graham Centre, Wagga Wagga
- The University of Sydney Plant Breeding Institute’s IA Watson Grains Research Centre, Narrabri, NSW
- The Australian Cotton Research Institute, Narrabri
- Sugar Research Australia
- Agricultural Marketing and Production Systems (AMPS), NSW
- Northern Grain Alliance (NGA), northern NSW and Queensland
- Grain Orana Alliance, Dubbo, mid NSW
- FarmLink Research, Southern NSW

Victoria

- AgriBio, Centre for Agribioscience, Victoria
- Grains Innovation Park, Horsham
- The Birchip Cropping Group Inc. (BCG), Victoria
- Mallee Sustainable Farming Inc., Victoria
New Zealand
- Plant & Food Research, New Zealand
- Foundation for Arable Research (FAR)

The United Kingdom
- ADAS Holdings Ltd
- Rothamsted Research
- The National Institute of Botany
- Scottish Rural University College
- John Innes Centre

The United States of America
- The Land Grant University model
- The University of Missouri

Canada
- Saskatchewan - the University of Saskatchewan,
- Ontario - Ontario University of Guelph, Ontario - The Ontario Ministry of Agriculture, Food and Rural Affairs and the University of Guelph partnership (OMAFRA-U of G Partnership)

France
- The National Institute of Agronomic Research

Brazil
- Brazilian Agricultural Research Corporation (EMBRAPA)

Holland
- Wageningen University