



INDUSTRY BRIEFING

PROC-9176982

Presented by Allison Pearson
& Sarah Marchioro

In the spirit of reconciliation, GRDC acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples today.



AGENDA

- About GRDC
- About GRDC's Accelerating Genetic Gain Strategic Initiative
- PROC-9176982 – AccGG EOI#1
 - Structure and scope
 - Considerations for Application
 - Subsequent processes
- Question and Answer Session

ABOUT GRDC

Australia's Grains Research and Development Corporation

AUSTRALIAN GRAINS INDUSTRY AT A GLANCE 2022-23

22,491



Number of levy payers in 2022-23



1.67% growth

in total factor productivity of cropping farms, climate adjusted

(1.54% TFP growth 2020-21)



91.5 billion

Total value of farm production in 2022-23

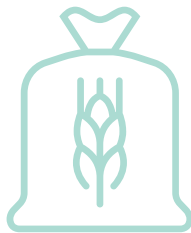
(up from \$87.9B in 2021-22)

 **34%**

Grains industry share of Australia's total gross agricultural 2022-23

(32% share in 2021-22)

70.8 million tonnes



Grains produced in 2022-23

(66.5M tonnes produced in 2021-22)

51.7 million tonnes



Volume of grains exported

(44.7M tonnes exported in 2021-22)

4.5%



Average rate of return for Australian cropping farms (excluding capital appreciation) 2023

(4.5% RoR in 2022)

OUR PURPOSE

To invest in research,
development and extension
to create enduring
profitability for
Australian grain growers.



GRDC INVESTMENT AND IMPACT 2022-23

\$176.9
million



Total consolidated R&D
investment (\$177.1M in 2021-22)

833



Total number of
active investments
(25.4 million hectares in 2021-22)

30%

New investments*



70%

Ongoing investments*

Source: GRDC Annual Report 2022-23

* % of new versus ongoing investment. New investments are those with a start date between 1/07/2022 and 30/06/2023.

Ongoing investments are those with a start date before 1/07/2022.

ACCELERATING GENETIC GAIN

Strategic Initiative

ACCELERATING GENETIC GAIN SI

- Australia's grain crops currently have a genetic gain for yield less than 1% pa
- Now opportunities to adopt and develop new technologies that will:
 - create step change in the magnitude of yield improvements;
 - reduce breeding cycle time;
 - allow more traits to be incorporated into each variety (e.g. disease, yield stability); and
 - enable and accelerate the deployment of pre-breeding research outputs.
- GRDC is seeking co-investment for \$20 million of targeted research and development investment that will deliver a step change in the genetic gain of Australian three largest grain crops.

ACCELERATING GENETIC GAIN SI

- The expected Outcome is:

By 2029, new transformational genetic technologies are developed, evaluated in collaboration with Australian breeding programs, with the potential to increase the genetic gain for yield to at least 1% pa for wheat, barley and canola.

Grower Outcome: By 2039, transformational genetic technologies are implemented in Australian wheat, barley and canola breeding programs, with growers receiving improved varieties with an annual genetic gain in yield of at least 1%.

This outcome will be achieved across multiple projects under the Accelerating Genetic Gain Strategic Initiative.

ACCELERATING GENETIC GAIN SI

Phase 1 - Global Engagement (Sept – Oct 2023)

- GRDC engaged throughout Australia and internationally to identify opportunities to drive genetic gain

Phase 2 - Expression of interest (April 2024 onwards)

- A series of competitive two-stage EOI processes to identify and engage co-investment partners to deliver on investment priorities identified in Phase 1.

PHASE 1 – GLOBAL ENGAGEMENT

- A. Improved predictive breeding to manage genetic complexity.** For example, applying crop models, improved imputation methods, optimum contribution selection and evolutionary computing.
- B. Creating and using genetic diversity.** For example, unlocking the potential of genome editing, improved transformation systems, improved trait introgression, and more effective use of wild relatives for Australian crop improvement.
- C. Exploiting heterosis.** For example, defining and optimising heterotic groups for wheat and canola.
- D. Developing accelerated breeding systems.** For example, platform technologies such as cost-effective doubled haploids, apomixis, improved crossing efficiency and others.



PHASE 2 – EXPRESSION OF INTEREST

Multiphase approach to market chosen to:

- reduce barriers for application by traditional and non-traditional partners
- allow a broad range of project concepts to be submitted
- provide more flexibility for tailoring the outputs of projects to the proposed concept.

AccGG SI updates provided at: <https://grdc.com.au/research/partnerships-and-initiatives/major-initiatives>

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Structure and scope

STRUCTURE



* Indicative timing only

SCOPE

Two priority focus areas are covered by this EOI

Theme	Priority Area	Description	Other Details
B Creating and using genetic diversity	B.3 Utilising the B genome diversity in canola	<p>The B genome of Brassicas possess a number of desirable traits that would be of benefit to canola (AACC). However, integration of B genome genes into canola is difficult due to the genetic controls which prevent non-homologous pairing of chromosomes and the recombination which can occur.</p> <p>There is a need to develop innovative methods to integrate valuable segments of the B genome, without the instability and agronomic penalties that occur with the addition of the whole B genome.</p>	Target crops: Canola Indicative project size: medium four-year project

SCOPE

Two priority focus areas are covered by this EOI

Theme	Priority Area	Description	Other Details
D Developing accelerated breeding systems	D.2 Development and integration of breeder facing AI tools to maximise use of pre-breeding research outputs and improve breeding processes.	<p>As the number of sources and types of breeding and pre-breeding information increase, there is an increased need for tools that allow quick access to accurate and useful information for breeder decisions.</p> <p>A new generation of AI tools have recently been developed that could be applied to this challenge to increase and accelerate the use of GRDC pre-breeding project outputs in Australian breeding programs.</p>	<p>Target crops: Wheat, barley, canola</p> <p>Indicative project size: small three-year project</p>

OPPORTUNITIES FOR COLLABORATION

Analytics for the Australian Grains Industry (AAGI)

- AAGI is a GRDC strategic partnership with University of Queensland, Curtin University and University of Adelaide
- AAGI has strengths in bioinformatics, machine learning and artificial intelligence.
- AAGI is available as an in-kind GRDC contribution to these investments
- To discuss potential support and collaborations with AAGI, contact AAGI Director, Dr Nathan O'Callaghan.

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Considerations for Application

POINTS TO CONSIDER

Enquiries will be accepted throughout this application period until 5:00PM AEST Wednesday 24th July 2024. Please send all enquiries to tenders@grdc.com.au

Application Requirements

- Your response file name must include the EOI Reference number PROC-9176982
- Ensure you address all requirements for Conditions for Participation in a statement addressing each of the conditions.
- Maximum 10 pages in PDF format inclusive of images, charts, references, supporting documentation etc.
- The Evaluation Criteria needs to address 4 key components, full details of the Evaluation Criteria can be found in the document [PROC-9176982 Expression of Interest \(PDF\)](#) on the GRDC website.

[RFT Terms and Conditions](#) are unique to this EOI

LODGING YOUR EXPRESSION OF INTEREST

All responses will be screened and will be excluded from consideration if;

- The response is not received by the Closing Time
- The respondent does not meet a Condition for Participation
- The response includes electronic files that cannot be read or decrypted or exceed the file size; or
- The respondent does not comply with any other requirements of this EOI.

Applications must be emailed to tenders@grdc.com.au by the **Closing Time**

*Aim to get them in early in case you experience technical issues – it will allow us time to assist you.

KEY DATES

- Closing time for enquiries Wednesday 24th July 5:00PM AEST
- **Closing time for applications Wednesday 31st July 2:00PM AEST**
(Canberra time for international applicants)

This is a firm deadline with no extensions or late applications accepted

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Subsequent process

SUBSEQUENT PROCESSES

Evaluations of tenders will commence shortly after with notification of the outcome expected to occur mid – late August.

Successful EOI applicants will then be invited to participate in a limited Request for Tender.

- Expected timeline for this limited tender will be **late August – early September** and applicants will be given until early December to complete applications.
- It is important to note, negotiations will begin early in the new year with the intent to have the contract executed by end of May 2025

[GRDC Tenders Website – Other Opportunities](#)

QUESTIONS?

Additional questions can be submitted to tenders@grdc.com.au up until 24/07/2024
2:00PM AEST

PRE-MEETING QUESTIONS RECEIVED

- The description refers to “*A new generation of AI tools have recently been developed...*”. Would it be possible to provide examples of the AI tools referred to or clarification about the type of AI tools? “AI tools” on its own allows to interpret the description in very different ways otherwise.

Response:

As part of the EOI process we want applicants to describe the types of tools that they believe could be used to achieve the outcome, however, an example of an AI tool that could be utilised is the incorporation of Large Language Models (LLM) to interrogate pre-breeding data.

- I would like to know if the description for EOI D2 “maximise use of pre-breeding research outputs” is referring to outputs that have already been generated, or is it also referring to pre-breeding outputs that could come from future projects? In this sense, I would like to know if the emphasis is on the development of an AI tool, or the development of an improved breeding practice that incorporates an AI-based tool?

Response:

This is referring to both pre-breeding outputs that have already been developed and future pre-breeding outputs. The emphasis of this investment is on the development of an AI tool that breeders can use to assess pre-breeding knowledge and data which will inform their breeding strategies, not the development of an improved breeding practice that incorporates an AI-based tool.

PRE-MEETING QUESTIONS RECEIVED

- When in the EOI document it says “A new generation of AI tools have recently been developed that could be applied to this challenge to increase and accelerate the use of GRDC pre-breeding project outputs”, are GRDC thinking of specific tools? Or AI more generally?

Response:

As part of the EOI process we are seeking ideas from applicants on what they believe will be the best approach to achieve the outcomes.

- This is a ‘small size’ investment - what does this mean roughly in \$\$? Ball park. Does this assume the project would apply existing methods rather than extend on or develop new tools?

Response:

We are unable to provide details of the value of the EOI, however the project can apply to either existing methods or extend and develop new tools. The EOI is for applicants to show GRDC what tools and technology would be best able to achieve the outcomes.

- Given that there will be a number of calls targeting the four themes – do you have any recommendation as to how applicants should structure/target technology offerings across EOIs. For example, some technologies or approaches may be relevant to multiple EOIs.

Response:

If there is a valuable solution to the problem presented in each of the EOIs then applicants can submit applications to each outlining how the technology has the appropriate fit to the issue.

PRE-MEETING QUESTIONS RECEIVED

- In the Brassica B-genome EOI there is a focus on methods in the description. Is GRDC also seeking specific trait introgressions (e.g. blackleg genes)?

Response:

GRDC is not seeking specific trait introgressions but rather a method that can successfully integrate any B genome genes that may be of benefit for canola growers, applicants may want to choose an example trait to demonstrate the technology.

- Could collaborators in an overseas government or university research organisation access funds from any project resulting from this EOI or would their contribution have to be in-kind only?

Response:

Collaborators can receive funds from any project for the contribution that they have made that may result from this EOI as long as there is a clear benefit to Australian grain growers.

PRE-MEETING QUESTIONS RECEIVED

- Will you provide access to complimentary partners during the EOI process?

Response:

On assessment of the responses to the applications submitted for the EOI, it may be identified that complementary or similar approaches and expertise is present. Where we think this may make for a better solution, we may ask applicants to collaborate during the second stage of the process.

- When should we reach out to AAGI?

Response:

Please feel free to reach out to AAGI at any point in the EOI process. They will then be aware that you may need their support in the future.

**THANK YOU FOR
ATTENDING
TODAY'S INDUSTRY
BRIEFING**

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