

KIT 2.4

Develop new, novel, high-value uses of products and by-products targeted at:

- human health, nutrition and allergenicity
- high-value feed uses
- new industrial uses
- biofuels.



Impact	Grower profitability is improved through access to new, novel, high-value markets for Australian grains and grain crop by-products
Summary	<ul style="list-style-type: none">• Growers and other grains industry participants are able to identify new, novel, high-value uses of grains and grain crop by-products.• GRDC invests where it can be clearly demonstrated that growers will capture value from the new use of a grain or grain crop by-product.• GRDC seeks to partner with value chain participants to develop the knowledge and tools to assist growers to capture value from new uses of grains or grain crop by-products.

OVERVIEW

While it is expected that the Australian grains industry will continue to produce and export largely undifferentiated bulk commodities there remain significant opportunities to further differentiate grain and grain crop by-products to extract higher grain prices and deliver enhanced profitability for Australian grain growers.

The Australian grains industry has traditionally positioned around food grade grain but is now responding to other markets that are emerging, maturing or becoming more sophisticated in their specifications. Food use will remain an important sector. A global population that is more conscious of health and has a greater proportion of disposable income creates the opportunity to capture value from novel grain functionalities or grain constituents related to health and wellbeing. GRDC has exploited opportunities to attract premium prices from novel functionality for human health benefits in the past – examples include high-amylose wheat and ultra-low gluten Kebari® barley developed jointly by GRDC and CSIRO.

There is already significant demand for the use of Australian grains for animal feed. The feeding of livestock is by far the largest domestic market for Australian grain. Global livestock production has also increased consistently over the years. The increasing demand for grain for animal feed, increasing producer understanding of the differing animal growth performance on different grain feed types and the narrowing of the genetics of the animals may create opportunities to capture value from novel grain functionalities that provide superior nutrition or maximise feed conversion. GRDC has previously exploited opportunities to extract premium prices from novel grain functionality for aquaculture feed through the development of Omega-3 canola with CSIRO and Nuseed.

Strong markets for bio-based fuels and industrial products are also emerging. The biomass to generate biofuel in Australia can come from a vast variety of sources such as low-grade and surplus crop products (off-spec, low quality grains), and crop residues from a range of crops such as grains, sugar cane, forestry, horticultural residues. The role of grains and grain crop by-products in the biofuels industry will likely be highly contested and regional in nature given the sensitivity that the biofuels industry has to feedstock logistics costs. Markets are also emerging for bio-based industrial materials which arise from biorefinery processes that use biological feedstocks to produce products to substitute or replace crude oil-based petrochemical products. There may be opportunities to capture value from the development of grain with novel compositions that can be used as feedstocks for the generation of bio-based industrial materials or for processing to extract high-value extracts or fine chemicals.

The objective of this KIT strategy is to identify new, novel, high-value end uses for grain and grain crop by-products and in turn develop the knowledge and tools required to assist Australian grain growers in capturing value from these new uses. Key Investment Target (KIT) 2.4 is partitioned into two linked phases which reflect the scope areas of this strategy.

The strategy phases start with identifying opportunities for new novel, high-value uses of grain and grain by-products where the value can be captured by growers. The new, novel uses could include grain as a direct use product (eg human food and animal feed), indirect use (eg as an ingredient) or as a feedstock use. The new uses may be for the harvested grain or grain

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crop by-products of any of GRDC's 25 leviable crops. For grain crop by-products, this KIT strategy will focus on the by-products of grain production where the by-product is generated on-farm as growers rarely capture value from post-farmgate processing of grains or grain crop by-products. This KIT will focus on new, novel high-value uses for grain and grain-crop products. Other KIT strategies describe the investment priorities for realising higher prices from current Australian grain product through delivery of high-value crops for existing markets (KIT 2.1), differentiation of current product to meet new end uses (KIT 2.2), and processing of current product to generate altered functionality for existing and new uses (KIT 2.5). GRDC currently has limited investment in the development of new grain products or new grain crop by-products for new, novel high value uses, so the identification of opportunities will be the major focus of this KIT strategy.

The second phase of the KIT strategy is delivering solutions to facilitate and enable grain growers to capture benefit from the identified differentiation opportunities. It will be critical to strike a balance between the long-term investment required to generate new grain products and grain by-products with the certainty that markets for the new, novel high-value uses of grains and grains by-products exist.

FUTURE RD&E FOCUS

SCOPE – Market intelligence and value chain analysis

Opportunities for new, novel, high-value uses of grains and grain by-products, where the value can be captured by growers, are identified.

The major objective of KIT 2.4 is to identify opportunities for new, novel, high-value uses of grain and grain by-products where value can be captured by Australian grain growers. There is an abundance of information on mega trends for the use of cereals, pulses and oilseeds and their crop residues but this information is not collated and related back to specific opportunities that could impact Australian grain production.

Investment Outcome 2.4.1 – Grain growers and the broader grains industry are aware of new, novel, high-value uses of Australian grains and grain crop by-products.

Good market intelligence will ensure that opportunities for new, novel, high-value uses of grain and grain by-products are identified. To identify the most valuable opportunities, it is critical to access strategic intelligence on medium to long term market drivers and trends. Understanding these market trends is critical to assessing the longevity of the opportunity against the time to develop a new grain product or grain crop by-product. Where possible, GRDC will partner with grains industry participants to leverage existing resources and effort in the capture and translation of market intelligence.

Translation of the market drivers and trends into a specific opportunity where value can be captured by Australian grain growers is essential. GRDC will invest in value chain analysis to identify those opportunities where the value captured by Australian grain growers is maximised and identify value chain partners necessary for product development and product delivery.

SCOPE – Delivery

Knowledge and tools are delivered to growers and other grains industry participants.

GRDC will invest in the development of new knowledge and tools that provide that Australian grain growers with the opportunity to capture value from new, novel, high-value uses of grain and grain crop by-products. It is critical that resources are directed at the right long-term opportunities and resourcing will need to be prioritised based on the potential benefit to Australian growers.

Investment Outcome 2.4.2 – Grain growers and other grains industry participants have the knowledge and tools to maximise the value that may be captured from new uses of grains and grain crop by-products.

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New tools may include the development of new grain products and grain crop by-products with novel functionality. Such development is a significant undertaking requiring a multidisciplinary and value chain approach. New tools may also include the development of on-farm processing of new grain or grain crop by-products where on-farm processing maximise the value captured by Australian grain growers. New tools may also include the deployment of existing overseas technology within Australia, through collaborative product development with technology owners or licensing of technologies for deployment in Australia.

The development of new grain products and grain crop by-products with novel functionality, and post-harvest processing can potentially require long-term investment and take many years to see the results. It is critical that resources are directed at the right long-term opportunities and resourcing will need to be prioritised based on potential benefit to Australian growers. GRDC will seek to leverage its investment by partnering with other investors and appropriate value chain participants. Likewise, GRDC is open to approaches from industry stakeholders to co-invest in the development of new knowledge and tools where Australian grain growers will receive a clear benefit in return for GRDC's investment.

