

KIT 2.5

Improved processing efficiency for enhanced value.



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| Impact | Growers capture greater value through supplying grains that meet current specifications and target new processing methods and products. |
| Summary | <ul style="list-style-type: none">• Supply chain partners understand the impact of varieties, regions and climates on grain processing functionality.• Improvements in grain testing and segregation enhance the ability of growers to capture value in the supply chain.• New grain functionality complements “clean labels”, reduced water and energy use, and ingredient additives or substitutes to create additional value.• Technical information, skills and capacity development enable the grains industry to capture greater value from supply chains and new functionality and processing methodology. |

OVERVIEW

The aim of Key Investment Target (KIT) 2.5 is to support the identification of opportunities to increase the price of grain that growers receive by improving the value of grain in the processing stage of the supply chain.

The manufacture of flours, meals and oils, and higher value products such as starch, proteins and other grains constituents requires several processing steps. Like most manufacturing processes, the efficiency of processing can be influenced by variations in the quality and consistency of inputs. Better processing efficiency can be achieved by improving the quality and consistency of grain inputs, along with the development of technologies and methods that improve grain processing steps.

For efficient grain processing, several quality characteristics need to be met by grain inputs, including grain size, shape, weight, colour, hardness and freedom from impurities, to name a few. However, a multitude of factors, including changing seasons and environments have the effect of changing the ratios of these grain quality parameters, which can in turn cause variability in grain processing from season to season. These environmental effects on grain quality variability are currently mitigated by agronomic management by grain growers, along with established Australian grains industry standards such as variety classification, grain receival standards, and bulk grain segregation mechanisms along the supply chain.

The identification of new tools and technologies for managing processing efficiency that can add to the price to grain growers will be considered for investment against this KIT. Investment by GRDC will require a clear articulation of how the processing efficiency gain will lead to greater demand from grain handlers or accumulators and/or how that would translate back to an increase in prices paid to Australian grain growers.

KIT 2.5 is partitioned into 4 scope areas. The first is to better understand the impact of variation in grain quality on various processing as a result of the environment and conditions in which it is produced. The second is to identify and capture opportunities better manage grain variability to improve the performance of millers, maltsters, bakers and brewers and crushers in extracting higher yields of flour, malt, oil and other products from the grain supplied. The third focuses on developing new grain qualities and new processing methods, while the fourth area of scope targets innovation skills and capacity as well as education and training along the supply chain.



FUTURE RD&E FOCUS

SCOPE – Understanding of variation in grain production and quality and its impact on processing

The composition of grain and therefore its processing yield varies by variety and is also influenced by region and climate. It is important for millers and maltsters to understand how this variability will impact on processing performance in extracting the relevant characteristics that they require.

Investment Outcome 2.5.1 – The grains industry has an improved understanding of how grain composition and functionality are affected by changes in variety, region and climate.

An important part of this knowledge will be to understand how the ratio of the various proteins and amino acids change as a result of changes in regions and climates and their impact on variety performance for specific end uses. This information would benefit millers particularly when understanding the performance of new varieties. New varieties of barley may need to be tested through to pilot brewing and this information provided to potential buyers. New entrants to pulse processing would also benefit from understanding the various types of proteins in current and new varieties as new end uses for them are found. New international buyers may not have a deep understanding of the classes and qualities of Australian grain, or their performance in particular processing regimes.

SCOPE – Identification and delivery of opportunities to manage current variation in grain production and quality to optimise processing efficiency

A critical point in understanding the benefits of segregation is to know the critical boundary for each trait in specifications for milling, malting or other relevant process, and understanding the market willingness to pay for the inclusion or exclusion of a particular trait at that level. Millers, bakers, maltsters, brewers and crushers all differentiate their products and, in some cases, use new or unique processing methods to extract extra value. It is important for growers to understand where the value limits are and then identify varieties, regions and climates that will work for those constraints. The research undertaken in Scope – Understanding of variation in grain production and quality and its impact on processing, will be valuable to establish the technical boundaries of product specifications used in this scope.

There are two desired outcomes within this scope.

Investment Outcome 2.5.2 – The grains industry has the knowledge and understanding to capture the opportunities of cost-effective differentiation and/or segregation along the grain supply chain.

Investment Outcome 2.5.2 is to understand cost effective options for differentiation and segregation for processing performance.

There will be cases where the market size of a specific market is too small for a grain handler to cost effectively segregate. In that case the market could be met by growers engaging directly with processors to segregate those suitable products on farm. If growers are engaging to directly supply grain to processors, then it may be necessary to understand the required grain specifications and/or measures of desired traits, including new tools that allow their measurement and segregation.

When considering Investment Outcome 2.5.2 there is a relationship with KIT 4.3, “improve the reliability and cost effectiveness or on-farm grain storage to reduce handling costs and capture market opportunities”, and therefore current and planned RD&E directed towards KIT 4.3 should also be considered, as well as KIT 2.2, “reduced downgrading” and “new or enhanced grain classification processes” should also be considered.

Investment Outcome 2.5.3 – The grains industry has the knowledge and capacity to precisely meet grain purchase specifications through the application of new test methods and tools.

Investment Outcome 2.5.3 aims to develop new test methods or devices to improve knowledge of the trait desired by processors and its corresponding measure in unprocessed grain.



SCOPE – Identification and delivery of opportunities for creating new grain quality and new variation in processing methodology

There are two desired outcomes within this scope.

When considering Investment Outcomes 2.5.4 and 2.5.5, current and planned RD&E that relates to KIT 2.3 and KIT 2.4 should also be taken into consideration

Investment Outcome 2.5.4 – The grains industry has access to new grain products that contribute to improved processing efficiency.

Investment Outcome 2.5.4 targets the identification and development of grain attributes that can improve processing efficiency, through altering the physical attributes or the biochemical composition of grains to improve their processability. There may be cases where there is a business case for the development of novel grain attributes that would allow less time or energy input in processing steps or require less additives. Changes to these traits should not be considered in isolation but in conjunction with other production traits, as the benefits of the traits in production may be larger than their costs in processing.

Investment Outcome 2.5.5 – The grains industry has access to new processing methods that can deliver greater value to supply chain participants.

Investment Outcome 2.5.5 supports the identification and development of new processing methods that can increase returns to growers. There may be multiple technologies that can increase processing performance, however, only those that produce a benefit for growers through an increase in price will be considered for investment. Examples of R&D that may lead to improvements include gluten manufacture, baking, malting, oil crushing or pulse processing.

SCOPE – Identification and delivery opportunities to achieve greater value through value chain communications and education

There are two desired outcomes within this scope.

Investment Outcome 2.5.6 – The grains industry has access to materials and training that facilitates improved sourcing of grain to optimise processing efficiency.

Investment Outcome 2.5.6 is focused on facilitating access to materials and training that will enable grain to be effectively sourced to improve processing efficiency. This could involve analysing the processing attributes of current or new varieties or developing or testing new equipment to improve processing performance, and the provision of training in using new varieties or methods in production processes.

Investment Outcome 2.5.7 – The grains industry has the skills and capacity in grain quality research, testing services, process development and product innovation to service supply chain participants effectively.

Investment Outcome 2.5.7 aims to ensure that the grains industry maintains the skills and capacity in product development and innovation in grain quality research, with a clear linkage on how activities in this space can increase grower returns. RD&E that does not provide a net return to growers would fall outside this scope.

Training in this context includes industry participants and students where the subject matter directly relates to sourcing or processing of grain. Activity construed as “marketing” is not within GRDC’s mandate. Research around grain quality traits would normally include processing performance. Quality issues around grade fit and downgrades in KIT 2.2 may be considered within this KIT 2.5 if it pertains to processing performance rather than grain differentiation. Quality issues associated processing with new, novel or high value uses in KIT 2.4. could be considered within this outcome; however, new development and new uses will be covered within that KIT.



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