

KIT 2.2

Maintain and/or improve the price of Australian grain through differentiation based on: functionality, food safety and traceability, sustainability of production, reduced downgrading, new and/or enhanced grain classification processes, and optimal management of biosecurity issues.



Impact Growers' profitability is improved through access to differentiated markets and/or reduced downgrading.

Summary

- Growers and other grains industry participants are able to identify, develop and implement opportunities for market differentiation.
- Growers have the tools and knowledge to reduce the occurrence and impact of downgrading.

OVERVIEW

The KIT 2.2 strategy focusses on the identification and capture of opportunities for improving the profitability of Australian growers through (1) differentiating their grain crop products to meet demand in current and emerging markets, and (2) identifying and capturing opportunities for reducing the impact and prevalence of downgrading on the price paid to Australian grain growers.

The current mechanisms for differentiation of Australia's bulk commodities include;

1. bulk segregation based on functional end-use requirements, supported by variety classification for crops such as wheat and barley,
2. grain receival standards and grading based mostly on physical quality and appearance,
3. the effective and prompt management of trade and market access issues as they arise.

Aligning the quality of Australian grain with end-user requirements will be important to maintaining our current bulk commodity markets. There may be opportunity for enhancing prices based on Australian grain capturing a greater proportion of premium-paying global markets and segregating and delivering products that better address the specific end-user needs of those markets.

Another opportunity to improve the price paid to Australian growers for their grain is through reducing the frequency and extent of downgrading. The majority of Australian grain is managed through commercial bulk handling systems where individual loads of grain are tested at point of receival for a number of attributes and on the basis of these results each load is graded. There can be large price differences between grades of the same commodity. There may be opportunities for increasing the average price paid to Australian growers through reducing the prevalence and/or impact of downgrading from premium price grades to discounted grades.

KIT 2.2 is partitioned into two phases (scopes). The strategy starts with identifying opportunities for higher price differentiation along with opportunities for reducing the prevalence and impact of downgrading. The second phase is delivering solutions to the opportunities identified in the first phase.

FUTURE RD&E FOCUS

SCOPE – Opportunities for market differentiation

Opportunities for growers to maintain or improve grain prices through market differentiation are identified.

Australian wheat, barley and oat industries have adopted varietal classification and receival grading systems as a means of maintaining quality standards and differentiation at a bulk commodity level.



The classes (e.g. ASW, APW, AH, APH, ANW and DR for wheats) are based on functionality largely aligned with specific end products or end-uses and are largely genetically determined (variety specific). For example, the wheat class ANW is specific for Udon noodles, while DR (durum wheat) is used to make pasta.

The grading system (e.g. AH1-AH2 or APW1-APW2 for wheats) is largely based on physical quality and appearance (screenings, test weight, foreign material, disease, insects, snails etc), as well as grain protein content. Grades are largely driven by the environmental conditions and agronomic management during the growing season.

The classification and grading system are applied simultaneously at point of receipt. A variety declaration is required which defines the potential class and grade eligibility. For example, only wheat varieties eligible for APH can be graded as APH1 or APH2. More than 30 functional quality characteristics (flour yield, water absorption, dough strength, loaf volume, noodle colour stability etc) are considered in determining the eligibility of a wheat variety to a given class, while more than 40 receipt standards are considered or assessed at receipt point for wheat. The combination of class and grade ensures consistent quality for buyers of Australian grain. Other crops, including canola, pulses and sorghum are differentiated based only on receipt standards.

Another key mechanism for differentiation is identity-preserved (IP) grain, which allows differentiation based on particular features of the grain, for example a specific desired functionality. Functional IP grain is usually segregated from bulk commodities based on specific differentiated functional attribute - for example high-oleic canola, or ultra-low gluten barley. Additionally, some markets are prepared to pay premium prices for grain produced in a specific manner e.g. organic, chemical free, produced with a low carbon footprint, or produced in a specific area or region. IP grain markets are generally lower-volume and specialised and can require high levels of information management to support provenance and traceability. Volatility in demand and price premiums mean these crops are often produced under pre-contracted, closed-loop systems.

At both a bulk level, but also at an individual farm or local scale, there may be further opportunities to differentiate based on factors such as quality, functionality, safety, traceability, sustainability and provenance.

Investment Outcome 2.2.1 – Growers understand the opportunities to maintain and/or improve the price of Australian grain through market differentiation, including:

- matching grain functionality with end use markets
- defining new market opportunities based on existing or new grain functionality attributes
- exploiting Australian advantages in crop provenance, food safety, traceability and sustainability.

Significant investment by GRDC and other organisations is directed towards demonstrating the functionality and quality of Australian grain in end-use markets. These activities broadly fall into three categories:

1. market intelligence to identify end use markets,
2. demonstrating the performance of Australian grains in the end use markets, and
3. improvement of crop varieties and the development of grain processing tools and techniques to either maintain current market share or develop new markets. However, there is a continuing need for research outcomes that assist Australian grain growers to maintain existing markets, and to identify new markets and end-use products.

Investment Outcome 2.2.2 – Growers understand the opportunities to reduce the prevalence and impact of downgrading.

For grain crop deliveries into Australia's commercial bulk handling systems, various receipt standards are assessed including grain size and weight (screenings and test weight), protein content, foreign material or organisms, and adverse features such as pre-harvest sprouting. Where minimum standards are not achieved, significant price penalties can apply, and grain deliveries may even be rejected outright. The receipt standards are influenced by abiotic and biotic environmental factors that can impact the crop during the growing season and to a limited extent during harvest and bulk handling.



Abiotic factors include the non-living parts of the environment such as water (rainfall), sunlight, oxygen, soil, wind and temperature. Weather has a large effect on many quality attributes and is an uncontrollable variable during crop management and prior to harvest. For example, rain, heat and frost can have catastrophic effects on grain quality attributes such as screenings, test weight and protein, but are not factors that can be easily managed by the grower.

Biotic factors are all the living parts of the environment that can influence crop production and quality, such as pests, weeds and diseases. In addition to direct losses, these factors can cause indirect damage because they can leave contaminants in grain. Significantly, moulds are a potential source of secondary metabolites or mycotoxins that can harm and even cause death to humans and animals. These abiotic and biotic factors effect on grain quality may be influenced by genetics, agronomic management during the growing season, and handling during harvest and storage.

Access to quantitative and qualitative data on the frequency and extent of downgrading is required, to answer the following questions:

- Which is the key quality/contaminants causing the most impact?
- Which commodities/regions are most affected?

Once the most important (frequency x impact) contributors to downgrading have been identified, the feasibility of prospective solutions and their potential economic benefits can be assessed, including what current options are available to manage issues, and to what extent are these options adopted by growers.

Wheat protein content, which is considered directly in KIT 2.3 “Wheat grain protein: Improve wheat grain protein through increased availability of nitrogen and better nitrogen use efficiency” is out of scope for this KIT.

SCOPE – Capture of opportunities for market differentiation

Tools and knowledge that support growers and other industry participants to capture opportunities for market differentiation are identified, developed and delivered.

Australian wheat, barley and oat industries have adopted varietal classification and receival grading systems as a means of maintaining quality and differentiating at a bulk commodity level. Other crops, including canola, pulses and sorghum are differentiated only on receival standards. RD&E investment that is directed at aligning the quality of Australian grain with end-user requirements will be important to maintaining our current bulk commodity markets.

Opportunities for enhancing prices, based on the capture a greater proportion of premium-paying global markets, and segregating and delivering products that address specific end-user needs will be investigated. These opportunities may be at a bulk level, or with niche IP grains markets that may require high levels of information management to support provenance and traceability.

Investment Outcome 2.2.3 – Growers and other grains industry participants have access to and knowledge of new tools for capturing and delivering opportunities to add value through differentiation.

GRDC will invest in the identification and prioritisation of new opportunities to improving price through differentiation for key Australian grain crops. Example opportunities that could be addressed include:

- Do the current linkages of functionality to end user requirements still hold for bulk segregations of wheat, barley and oats.
- Are there new classification opportunities for functionality that should be looked at?
- Can current variety classification systems become more efficient?
- Would variety classification systems benefit other crops such as pulses or canola? What future segregation may be warranted based on new end use opportunities, e.g. sorghum for cattle feed, poultry feed or baijiu; canola for food or industrial uses; and pulses for wholegrain or processing uses.
- What farm-scale or local opportunities can be captured based on differentiators such as provenance, traceability and sustainability? How can these differentiators translate to value to the grower?



Investment Outcome 2.2.4 – Growers and other grains industry participants have access to new tools and knowledge to limit the prevalence and impact of the downgrading of Australian grain.

GRDC will invest in the development of tools and knowledge that can reduce the prevalence and impact of downgrading. Issues with grain deliveries that can lead to downgrading include:

1. The presence above tolerance levels of contaminants such as pests, weed seeds, non-target seeds/grains, or disease and their secondary metabolites, and foreign material such as chaff, sand and stones;
2. Evidence of damage to grains above tolerance levels caused by arthropods, disease or weather;
3. Issues with grain quality above tolerance levels, such as high screenings and falling number.

RD&E opportunities to reduce the frequency and impact of downgrading will be considered in the following areas;

- Pre-planting decisions including variety choice.
- Post-planting and pre-harvest management decisions (e.g. tactical agronomy).
- Detection and mitigation decisions during harvest and storage operations.
- On farm segregation, blending and management of stored grain.
- Alternative ways for growers to market downgraded grain.

Improved differentiation of Australian grain represents both an opportunity to maintain current markets for Australian grain and to create valuable new markets. This, along with reducing the impact and prevalence of downgrading, has the potential to have a significant impact on the profitability of Australian grain growers. However, it is critical that the resources are directed at the right long-term market opportunities, and resourcing will need to be prioritised, based on potential benefit for Australian growers.

