

# PLANT INNOVATION DEEP DIVE



*Swathing in Western Australia - Charlotte Peakall (WA)*



# AWARENESS AND ADOPTION OF PLANT BREEDING INNOVATIONS

There is increasing interest in the potential of new grain crops developed with the aid of biotechnology in the Australian grain industry. Breeding programs using new breeding technologies, including gene editing, are currently underway<sup>1</sup>, and wheat that has been genetically modified to improve drought resistance is being commercially grown in South America. This wheat has recently been approved for trials in Australia<sup>2</sup>.

The grain industry has had a successful track record as stewards of these technologies. For example, genetically modified (GM) herbicide tolerant canola has been grown commercially since 2008.

It is important that the Australian grain industry draws on this experience as new crops are developed and introduced to market.

## Background

The development of gene editing and genetically modified organisms have had significant impacts for plant breeding. In the Australian grain industry, these technologies hold the potential to accelerate the development of drought-resistant, disease-resistant, and higher-yielding grain varieties. As climate variability intensifies and global demand for food grows, increased adoption of these technologies could help Australian farmers produce more resilient and sustainable crops, reducing the need for chemical inputs and improving consistency of production.

In its recent Annual Survey GrainGrowers asked growers questions to better understand awareness of these technologies and grower interest in their adoption.



*Fields of Gold - Kathi McDonald (WA)*

Biotechnology is the **use of living organisms**, cells, or biological systems to develop products and technologies. It is used in a wide range of applications, including **medicine, agriculture, and environmental management.**

<sup>1</sup>[Australian trial of gene-edited wheat aims for 10% bigger yields | Reuters](#)

<sup>2</sup>[Trigall Australia gets go-ahead for trial of GM wheat - Grain Central](#)

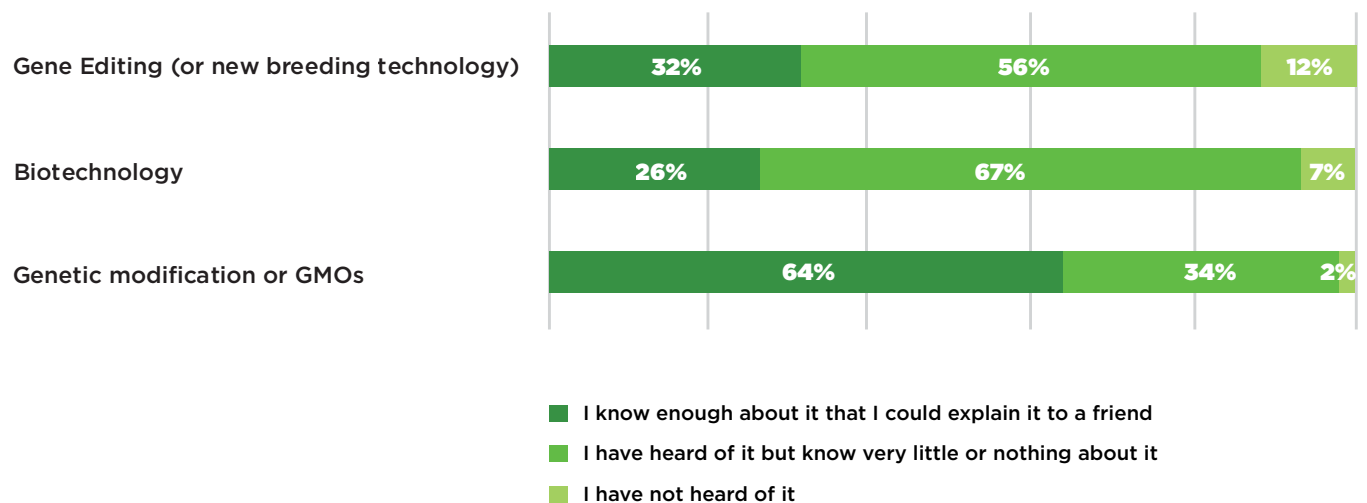
# LEVEL OF AWARENESS OF GENE TECHNOLOGY IN AUSTRALIAN GRAIN INDUSTRY

The survey results suggest that Australian growers generally have a much stronger understanding of genetically modified organisms and gene editing than the general community.

A similar survey of a broad cross section of the Australian community in 2024 indicated 20% or more had not heard of these terms, and often less than 20 percent of those surveyed felt comfortable enough that they could explain them<sup>3</sup>. These results indicate a clear difference between how growers understand these technologies compared with the general public. When compared with industry views, the general public it is likely to regard these technologies with greater caution. This difference of views is potentially driven by the use of GM crops and significant grower experience built up in the grains industry over a number of years.

**Gene editing allows scientists to make precise changes to an organism’s DNA, either by adding, removing, or altering specific genes within the organism. Gene editing doesn’t necessarily rely on the introduction of foreign DNA and can enable the targeted modification of traits with high accuracy and efficiency.**

## Grower awareness of biotechnology terminology



<sup>3</sup>Community attitudes towards gene technology” June 2024, Office of the Gene Technology Regulator

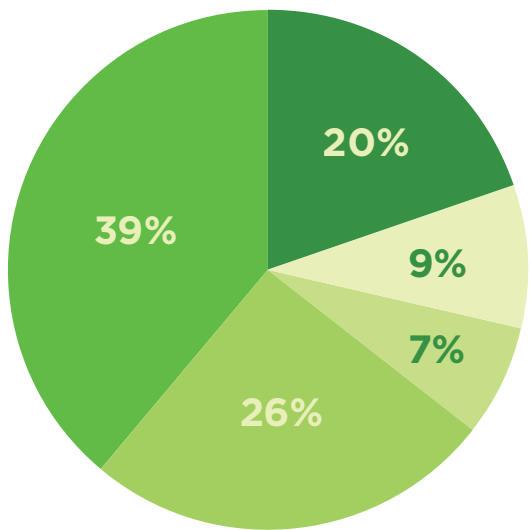
# INDUSTRY WILLINGNESS TO ADOPT GENETICALLY MODIFIED OR GENE EDITED CROP VARIETIES

Growers were asked about their willingness to adopt a genetically modified or gene edited crop variety, other than canola, in their farming operation within the next 5 years provided there was regulatory approval and market support. 59% of growers indicated they were very likely or somewhat likely to adopt a variety and would be considering information available as the varieties came to market. There are also growers that have reservations about the technology, with 16 per cent of respondents either expressing concerns or indicating that they would not adopt genetically modified or gene edited varieties.

GMOs are typically made by inserting entire **genes into an organism's DNA** to introduce the desired traits.

Gene edited organisms result from making precise, targeted changes to an organism's existing DNA. These subtle changes give the organism the desired traits.

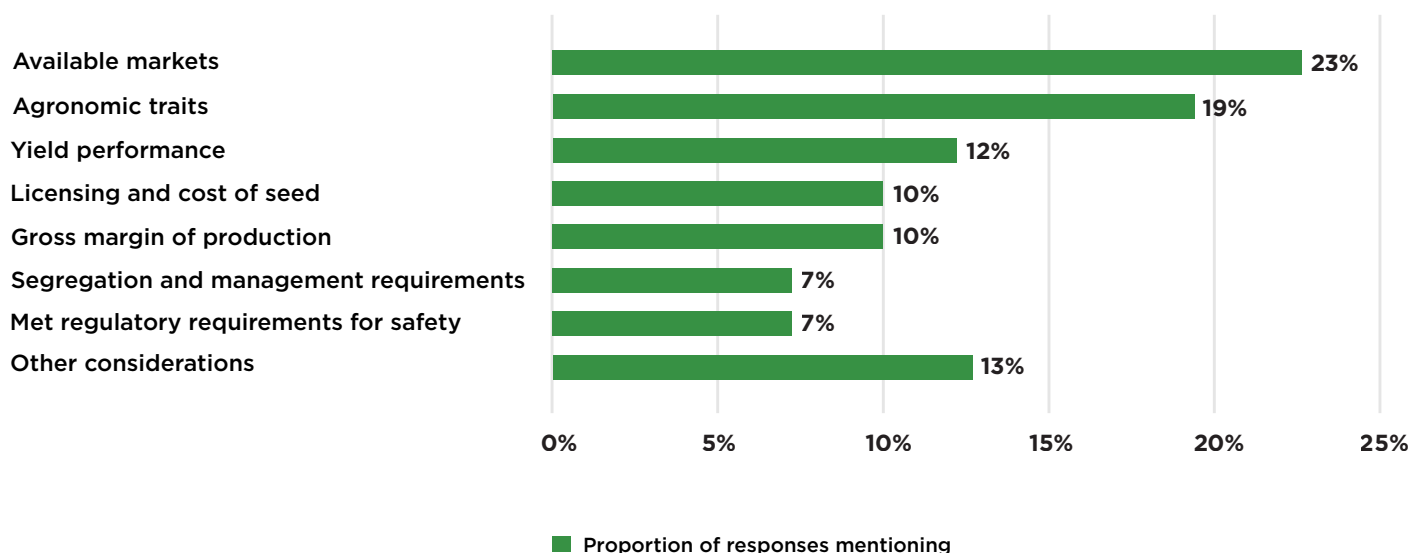
**Both gene editing and genetic modification are types of biotechnologies.**



- Very unlikely - do not intend to adopt
- Somewhat unlikely - have concerns or reservations
- Neutral - undecided at this time
- Somewhat likely - interested but need more information
- Very likely - actively seeking information and preparing for adoption

# WHAT INFORMATION DO GROWERS USE TO INFORM THEIR CHOICE TO ADOPT THESE NEW CROP VARIETIES?

Typically farmers scrutinise a range of factors when considering a new crop, including markets along with improved crop yields and agronomic traits such as the potential for improved resistance to pests, diseases, or environmental stresses that can reduce the need for chemical inputs. Our survey indicates that similar considerations are made when growers are considering the choice to adopt genetically modified or gene edited crop varieties.



The market demand and consumer acceptance of the new varieties was the most mentioned consideration when thinking about adopting a genetically modified or gene edited crop, followed by agronomic traits and yield performance, particularly under local conditions. Specific agronomic traits identified by growers included pest and disease resistance, along with weather resistance (including drought and frost), grain quality and crop maturity characteristics. Cost and licensing conditions for seed, gross margin of production as well the type and cost of requirements to segregate the seed on farm and at receipt were also mentioned as being considerations. Regulatory considerations, including assurance that there was compliance with government requirements that the new crop met health and environmental safety assessments were noted as important. A variety of other considerations were mentioned, including opportunities for traits that were beneficial to consumers, the importance of community support and social license, and the need to maintain choice in the market for growers and consumers.

The Gene Technology Regulator **oversees the environmental safety of genetically modified organisms (GMOs)**, ensuring they are safe for the environment and **human health** before they can be grown or released into the market.

Food Standards Australia New Zealand (FSANZ) regulates the **safety of food derived from GMOs** by ensuring that these foods are safe for consumption, providing guidelines for their **labelling and overseeing food safety standards**.

## INDUSTRY PREPARATION FOR NEW GENETICALLY MODIFIED OR GENE EDITED CROPS


Adoption of any new technology by Australian growers requires regulatory and market acceptance along with confidence in the integrity of our supply chains to deliver the quality demanded by customers. Ultimately farmers are looking to incorporate these innovations to meet consumer demands and benefit agricultural production systems through improving consistency of yields and grain quality, improving resilience to pests and diseases and reducing reliance on chemicals. Successful adoption of these technologies will require industry to work with plant breeders, the seed industry, and grain handlers to manage the grain within the supply chain and ensure markets and the community have confidence in Australian grain.

The results from this survey will be used by GrainGrowers to develop information materials to support growers understanding of new breeding technologies and new GM crops. As new varieties are developed, GrainGrowers will work with the supply chain to ensure information is available to support growers in making decisions about incorporating these new varieties into farming systems. GrainGrowers' website will be updated as this information becomes available, and updates will be provided through e-news.

## Stay in touch with GrainGrowers

Please visit us online or email if  
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