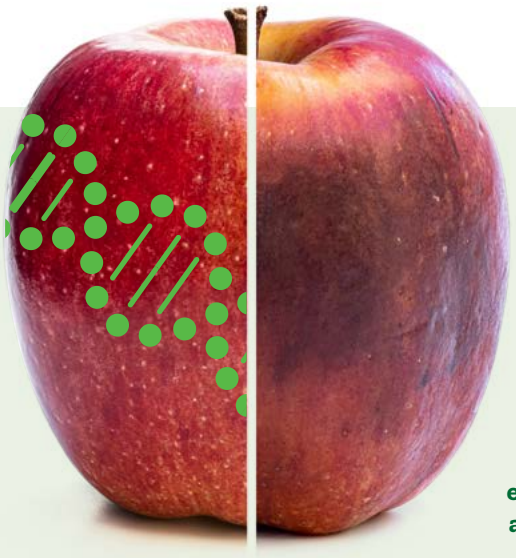
Ripe timing for gene-edited fruit and veg



Food produced using 25 million hectares of land is wasted

Gene edits that prolong shelf life and reduce bruising can slash food waste by up to 30%

On average food waste costs households around $2500 a year

Almost 50% of fruit and vegetables produced are discarded. That's the equivalent of throwing away 3.7 trillion apples

Australia is known for producing some of the best fruit and veg in the world, but we're also wasting far too much of it. Fruit is one of the top five most wasted foods in Australian homes, with billions of apples alone discarded globally each year. The reason? Often, it comes down to appearance.

Consumer research shows that up to 50 per cent of people would throw away a whole apple just because part of it has turned brown, even if it's still perfectly edible. This browning, caused by enzymes called polyphenol oxidases that react with oxygen, strongly influences how fresh we perceive food to be.

Plant scientists have been using conventional breeding and gene-editing to take fresher even further. By precisely silencing the genes producing these enzymes, they've created apple varieties that resist browning, without specialised sprays, packaging, or altering taste or nutrition.

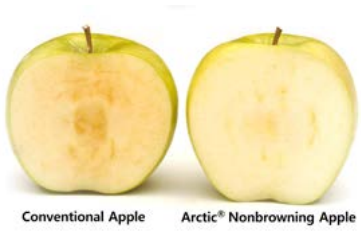
This small, precise genetic tweak can ripple through the supply chain, leading to fewer supermarket rejects, more lunchbox snacks eaten, and a dramatic cut in household food waste and spending.

In Queensland, researchers are applying similar technologies to tackle uneven ripening in tropical fruits like mangoes and bananas. By tweaking ripening hormones like ethylene, new trials are developing fruit that matures more evenly, with better colour and texture - traits essential for export markets and higher pack-out rates.

With collaboration among breeders, supply chains and regulators, new varieties like these could have a major economic impact on Australian agriculture.

Gene-editing isn't just a scientific curiosity, it's a practical solution to costly problems, helping growers reduce waste, boost profits, and deliver fresher produce that meets modern consumer expectations. Turning smart science into everyday savings.

Gene-silencing and the Artic Apple



Apple browning is caused by a reaction between oxygen and the enzymes polyphenol oxidases (PPO). CSIRO scientists discovered anti-polyphenol oxidase – a gene that when inserted into a fruit's DNA, reduces the production of PPO and stops it browning. This CRISPR technology has been commercialised in apples, bananas, potatoes and mushrooms and is now being used in new innovative ways to improve fruit and vegetable consumption and reduce waste.