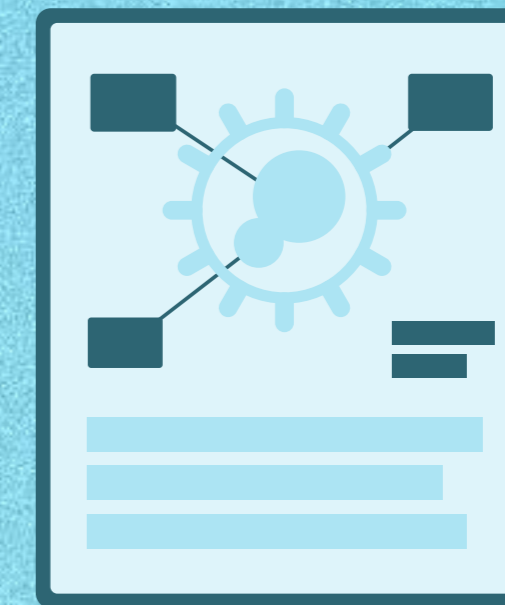


WHAT ARE NEW GENOMIC TECHNIQUES AND HOW ARE THEY USED IN PLANT BREEDING?

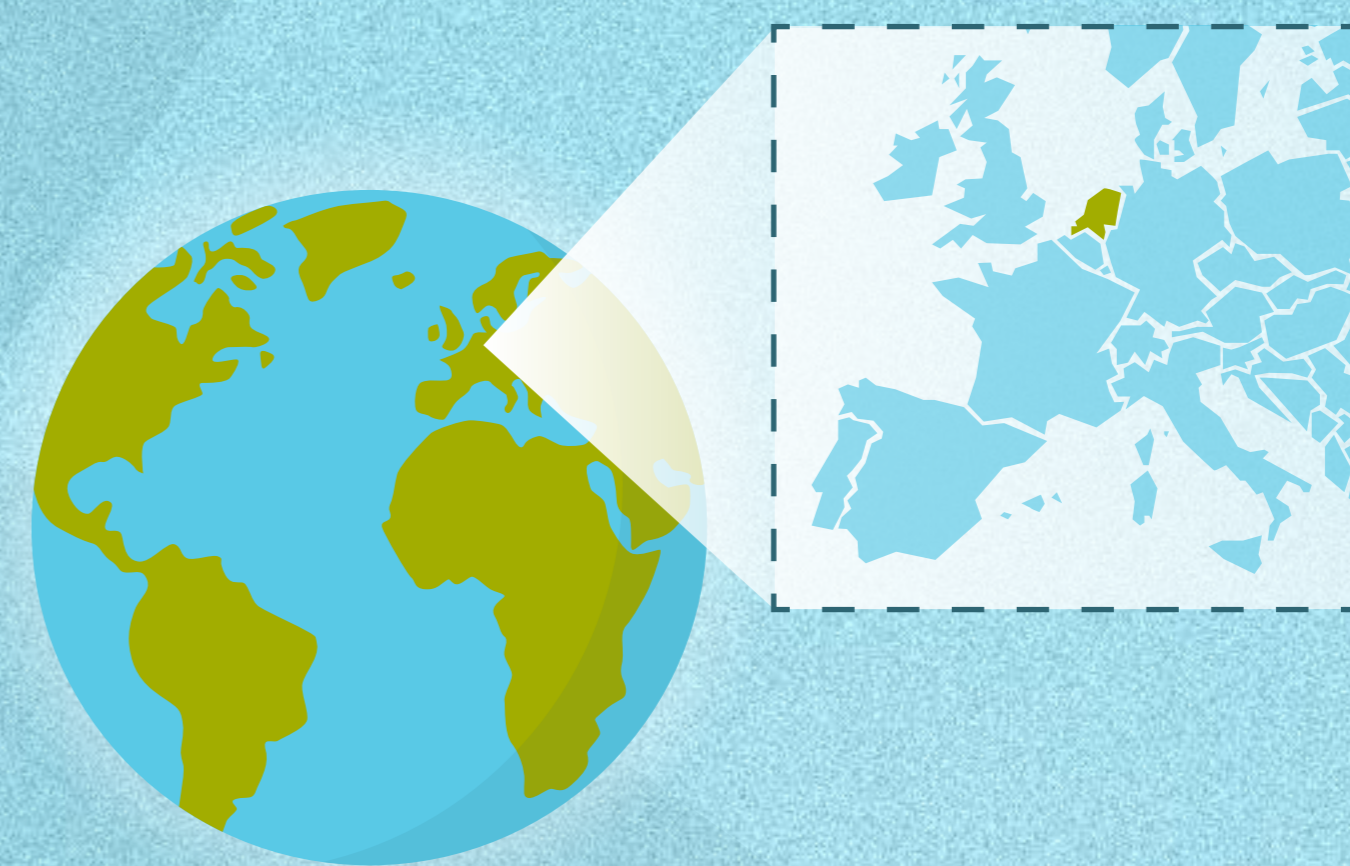
The science behind New Genomic Techniques



HOW ARE NGTS BEING USED IN PLANT BREEDING?

Across the globe, exciting advancements in the use of NGTs are leading to the development of crops that are more disease resistant, drought tolerant, nutritious, and which have longer shelf lives, higher yields, and can optimize inputs.

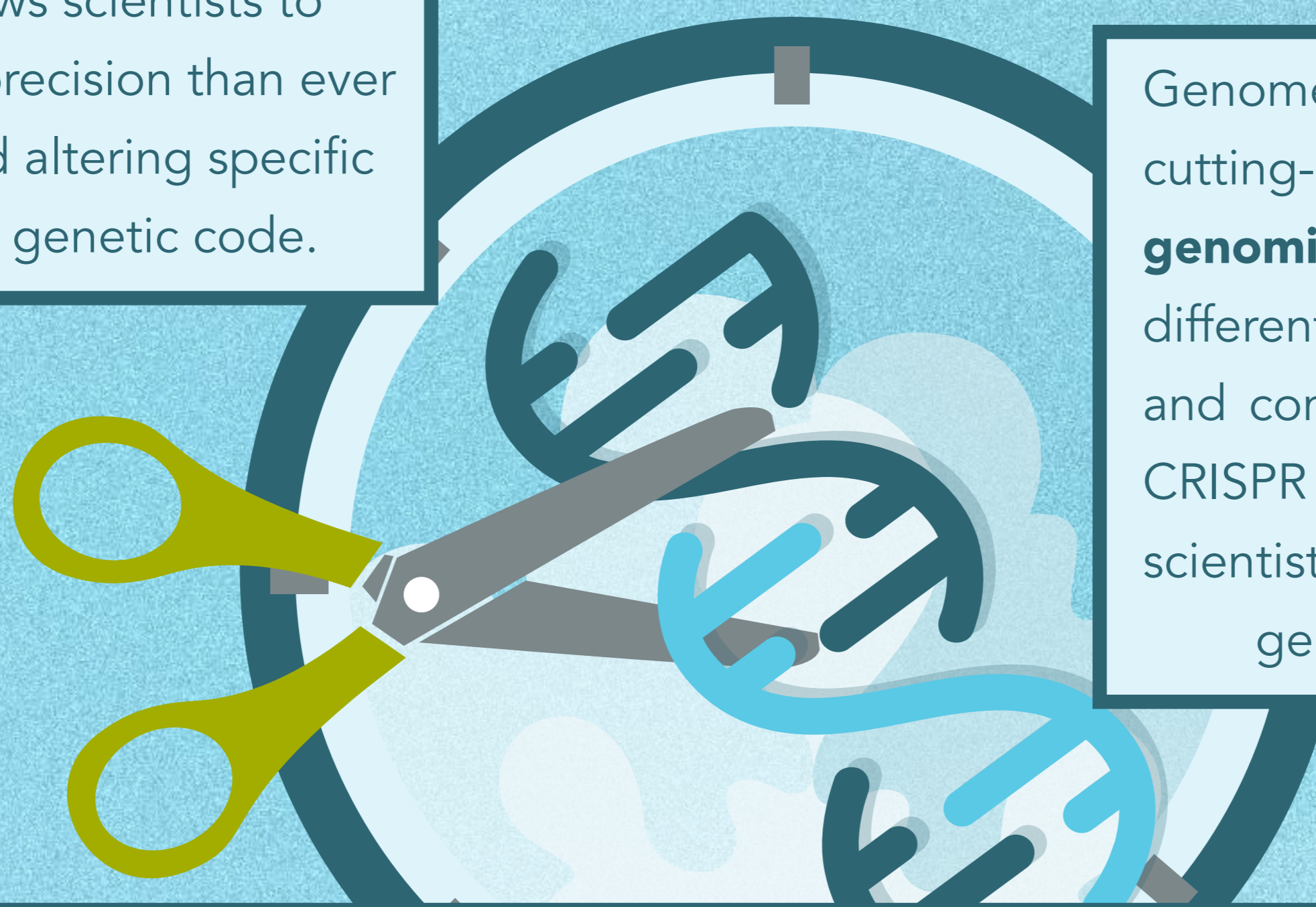
In **Europe**, Dutch-based Wageningen University & Research (WUR) has conducted successful trials for disease-resistant potatoes. NGTs overcome the challenges of breeding in vegetatively propagated crops like potatoes, where instead of seeds, new plants grow from parts of the parent plant.



Emmanuelle Charpentier and Jennifer Doudna were awarded the Nobel Prize in Chemistry 2020 for their pioneering work on CRISPR/cas9.

THE SCIENCE EXPLAINED

Genome editing allows scientists to modify DNA with more precision than ever before, by targeting and altering specific genes within a plant's genetic code.



Genome editing is achieved by using cutting-edge technologies called **new genomic techniques (NGTs)**. There are different types of NGTs, the most famous and commonly used of which is **CRISPR**. CRISPR acts as a scissor that allows scientists to 'cut' out and replace particular genes within a plant or animal's DNA.

Other novel tools used in plant breeding include **base editing**, and **templated editing**, which can be used to modify a plant's DNA to develop an improved plant variety.

WHAT ARE COMMON MISCONCEPTIONS?

People tend to confuse genome editing and NGTs with GMOs

While GMOs are the result of the insertion of DNA from a different species, new genomic techniques are used to make changes to the genetic code existing within the plant, or by introducing a gene already present within the same species.

In this way, NGTs are more like conventional breeding techniques, leading to similar improved plant varieties. Think of NGTs as a kind of accelerator! In many ways new genomic techniques are just the latest suite of tools that plant scientists can integrate into the plant breeding process to continually deliver improved plant varieties to growers and producers.

In plant breeding, NGTs allow scientists to introduce characteristics already present in a plant species – such as increased tolerance to drought or pests – into elite varieties that are commercially grown.

