

INFORMING POLICY FOR MODERN PLANT BREEDING

Modern precision breeding techniques, including gene editing allow us to make small changes to DNA; in plants this could be used for breeding improved crops.

We use these techniques for our research, helping us to understand how genetics influence plant growth and development. We have grown gene edited material in the field and understand the regulatory processes required to do this.

As experts in the field, we use our knowledge and experience to help politicians, farmers and the plant breeding industry to make informed decisions on these techniques.

HOW DO WE DO THIS?

- By responding to requests for information, evidence and advice we provide impartial and reliable scientific evidence to the UK Parliament on emerging topics of interest.
- We advise the Department for the Environment, Food and Rural Affairs (Defra) and the Food Standards Agency (FSA) on the safety of precision breeding and the effect it could have on UK crop breeding.
- We build relationships with the National Farmers Union (NFU), farming groups and with industry to open up discussion and to ensure accurate information is provided when needed.

What is Gene Editing?



SCAN FOR
MORE INFO




John Innes Centre
Unlocking Nature's Diversity

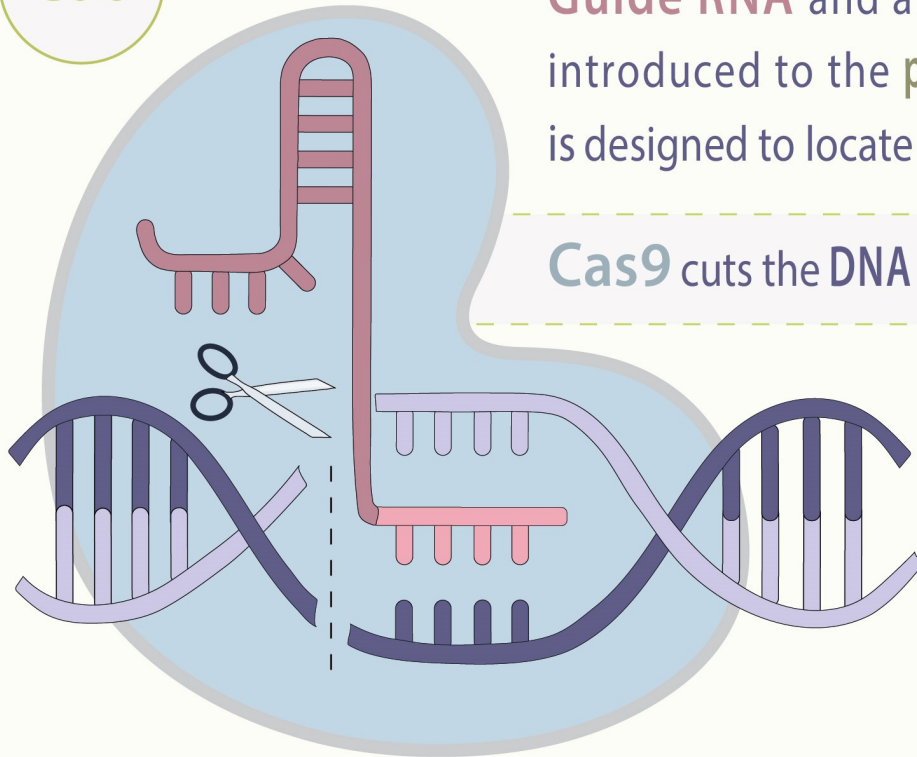
What is genome-editing(GE)?



Cut

Guide RNA and an enzyme (i.e **Cas9**) is introduced to the **plant cell**. The **guide RNA** is designed to locate the **gene** you want to edit

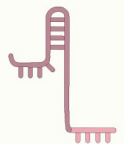
Cas9 cuts the **DNA** at the **precise target location**



Cas9



Guide RNA (gRNA)

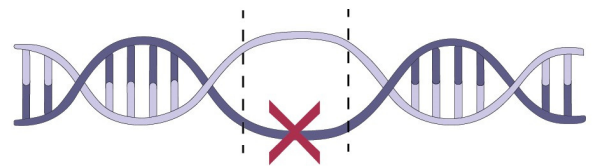


Guide sequence



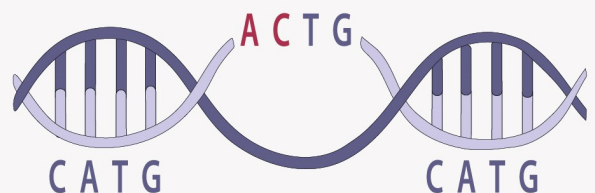
Delete

If **two cuts** are made near each other we can **remove small parts** of genetic sequence



Edit

If a **single cut** is made, the **plant cell** will attempt to **repair the break** - an often error-prone process resulting in a **'typo'**



This changes the genetic sequence by inserting/deleting a different letter of code