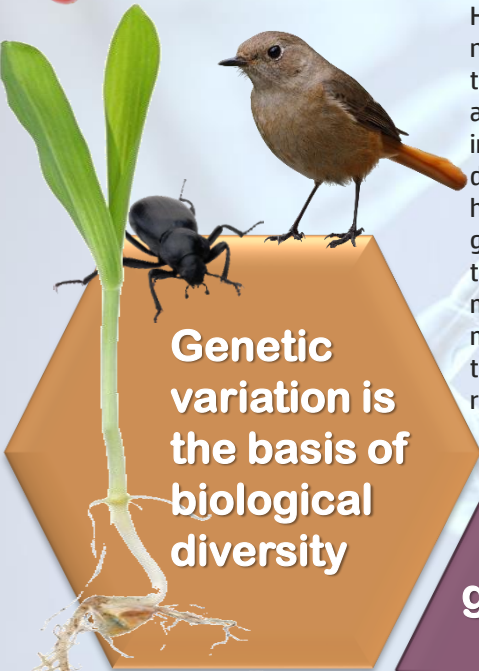


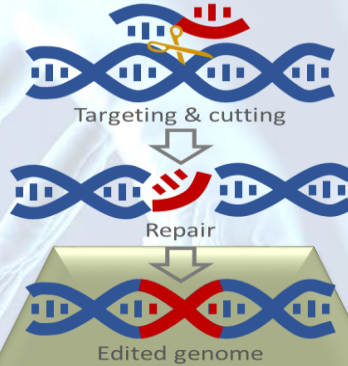
GENOME EDITING - the what, how & why



Genetic variation is the basis of biological diversity

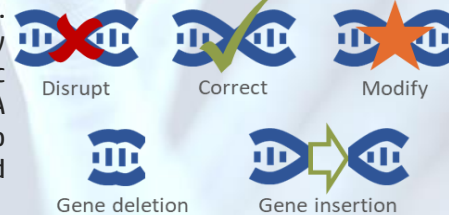
Humans have harnessed this natural genetic variation over the ages, through selection and breeding programs, to improve crop plants and domesticated animals. We have also actively induced genetic variation using techniques such as random mutagenesis and genome multiplications to introduce traits like higher yields, pest resistance and seedlessness.

Harnessing genetic variation has led to superior crops & livestock



Genome editing enables the precise alteration of genetic codes

Genome or gene editing refers to the practice of making precise changes to the genetic code of an organism in order to alter its phenotypic traits. A combination of naturally occurring molecular tools, e.g. CRISPR-Cas9, purposefully redesigned for every specific edit, and the cell's own DNA repair mechanisms are used to accurately identify, cut and repair the target sequence.



Genome editing techniques can be used to make small changes, similar to mutations that may also occur naturally, but more precisely, to disrupt, correct or modify gene activity. Alternatively, whole genes may be deleted or inserted. Inserted genes may originate from a sexually compatible organism (cisgenesis) or from a non-compatible one (transgenesis / genetic modification).

Genome editing is used to alter gene expression in specific ways



The precision, efficiency & low cost of genome editing makes it a powerful biotech innovation tool

The potential of genome editing is wide-ranging - it can be used to treat or eradicate diseases, develop pest resistant, high-yielding, environmentally adapted crops and livestock, nutritionally enhanced foods and much more. Genome edited organisms are not necessarily GMOs, as the designed genetic changes may be similar to genetic variation that may occur naturally, still, they will have to comply with relevant legislation to ensure their sustainability.

