

Protoplast
Fusion

Polyploidy

Cross Breeding

Transgenesis

Genome Editing
CRISPR

Mutagenesis



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Using an enzyme to change the DNA of a cell at a specified sequence.

Plant cells from two distinct species are fused together to form a new hybrid plant.

Breeding two compatible species in hopes of creating an offspring with the desired traits.

Introducing one or more genes from one organism to another.

Crossing two plants of the same species, but each parent plant has a different number of chromosomes.

Exposing seeds to chemicals or radiation to promote genetic mutations in hopes that the mutation will produce a desirable trait.

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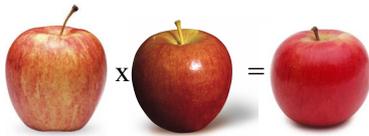
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The Jazz apple was created by crossing the Gala and Braeburn apple.



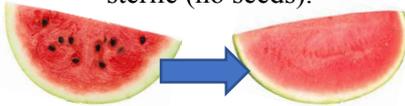
After exposing a grapefruit tree to radiation, a random genetic mutation produced fruit with a darker red color.



A hybrid variety of red cabbage was developed by fusing the protoplast cells of a radish and red cabbage.



Seedless watermelons were created after crossing a plant with 4 sets of chromosomes with a plant that had 2. The offspring has 3 sets and is sterile (no seeds).



An enzyme was used to change a specific DNA sequence in canola, making it tolerant to an herbicide to help control weeds.



The Rainbow Papaya was developed by inserting a gene that made the tree resistant to the Papaya Ringspot Virus.

