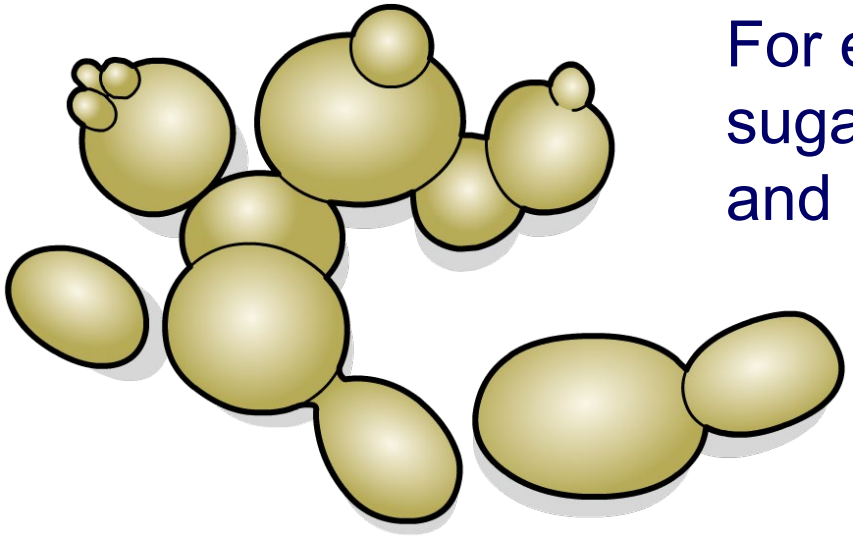
GM Organisms

What is genetic engineering?

Living things naturally create useful products.

Genetic engineering can be used to make living things produce other, more valuable, products.



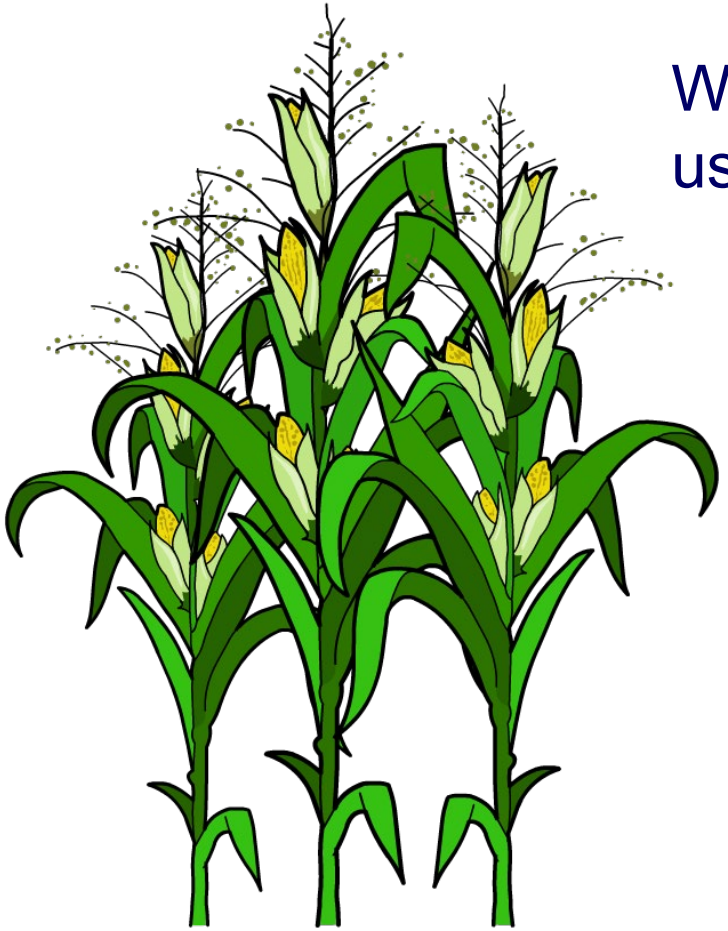
For example, yeast naturally converts sugar into carbon dioxide and alcohol, and is used in baking and brewing.

Yeast can also be genetically engineered to produce vaccines for human diseases.

Genetic engineering is about changing the DNA of a living thing to change its characteristics.

GM crops

Crops can be given extra genes for new and useful characteristics. They are **genetically modified** (GM).

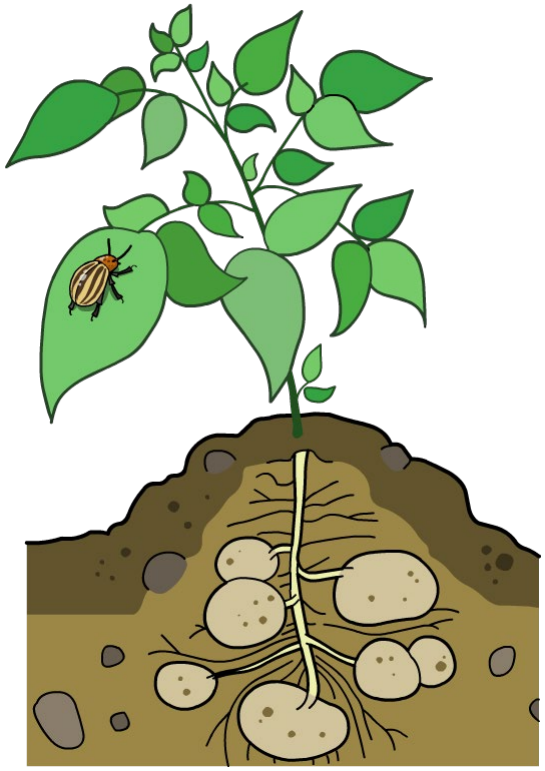


What characteristics might be useful in crops?

- pest resistance
- frost resistance
- disease resistance
- herbicide resistance
- drought resistance
- longer shelf life

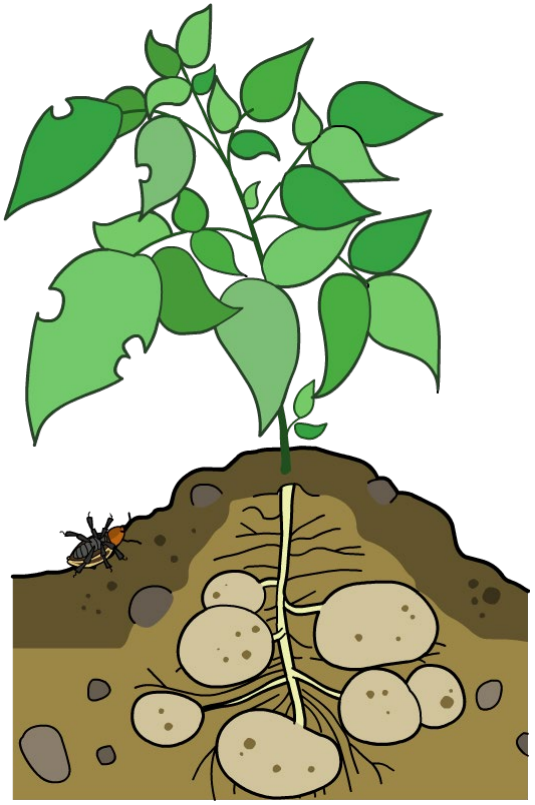
Pest-resistant crops

Potatoes can be genetically modified so they are toxic to pests, such as the Colorado beetle.



The gene for a powerful bacterial toxin is added to the potato plant.

If the beetle tries to eat the potato plant, it is killed by the toxin.

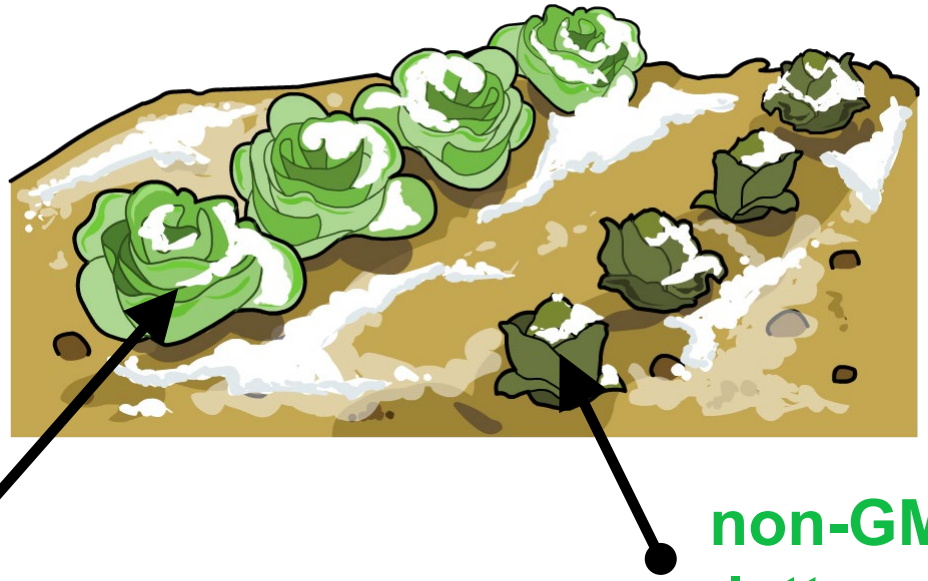


What benefits might this have for the environment?

Frost-resistant crops

Crops can be genetically modified so they are resistant to adverse environmental conditions.

For example, lettuces could be genetically modified to be resistant to frost.



Why are some people against the development and use of GM crops?

Plants with extra vitamins

Rice can be genetically modified to make beta-carotene, a substance that is converted into vitamin A in the body.

The color of the rice is an indication of how much more beta-carotene it contains.

The GM rice is called '**Golden Rice**' and is being developed to help fight vitamin A deficiency and blindness in developing countries.

Should GM crops be allowed?

What are the advantages and disadvantages of GM crops?

advantages	disadvantages

GM crops could give bigger yields

solve