

GM Plants

Genetically modified (GM) plants have additional small pieces of DNA to enable them to take on new beneficial traits. DNA can be transferred from one variety of a species to another variety, from a closely related plant, or from a completely different species.



Examples:

- GM papaya plants have been created in Hawaii, which are resistant to the damaging papaya ring spot virus.
- GM 'Bt cotton' plants contain genes encoding toxins, from the bacteria *Bacillus thuringiensis* (Bt). When specific moths, butterflies and beetles eat the 'Bt cotton' plant, the toxins bind to the insect's stomach; causing it to die.
- GM potatoes have been created, which contain a gene from a wild relative of the potato that is resistant to late blight disease. The gene enables the potato to recognise the pathogen and kick-start the plant's defence system so it can fight off infection.



Benefits

1. Breeding:

It can be extremely difficult or even impossible to breed different plant species with the desired features and so transferring genes directly into a plant can be a great benefit. This means that disease resistance can be introduced, without changing anything else, such as the size, colour and taste of fruit etc.

2. Gene Stacking:

It's possible to transfer several different resistance genes into plants. This process is called gene stacking; it can help provide plants with longer-lasting protection against a broader range of pathogens.

3. Environment:

Growing GM crops could help reduce pesticides use, which would lower fossil fuel use and release of CO₂ into the atmosphere.

Drawbacks

1. Doesn't always last:

There are a few reports emerging of pests developing resistance to GM crops. The pink bollworm (below) has evolved resistance to the first type of 'Bt cotton' that was developed.



2. Cost and environment:

If pests and pathogens do evolve resistance to GM plants, pesticide sprays will be used; increasing costs for farmers and environmental damage.

3. GM from field to nature:

GM pollen, carried by the wind could fertilize non-GM plants. In the European Union, there are areas around GM crop land, where there are no plants and so GM pollen should not fertilise non-GM plants.