

Current uses of gene transfer in crops, e.g. Bt maize

- **Herbicide resistance** – the gene for resistance to glyphosate weedkiller has been transferred from *Bacillus thuringiensis* (a bacterium) to the maize (corn) so the crop can be sprayed with the weedkiller but only the weeds are killed.
- **Insecticide resistance** - a gene from *Bacillus thuringiensis* has been transferred to the maize to code for a bacterial protein called **Bt toxin** that kills corn borer insects, which damage the maize.

Potential benefits of Bt maize:

- Less pest damage and higher crop yields → reduced food shortages.
- Less use of insecticides → cheaper crops, less risk to environment and workers.
- Less land needed → land used for wildlife conservation.

Possible harmful effects of Bt maize:

- Humans or animals eating the Bt maize might be harmed by the bacterial DNA or Bt toxin.
- Non-pest insects could be killed by eating the GM maize pollen.
- Cross-pollination could spread the Bt gene into some plants but not others → these plants would produce the Bt toxin and be 'selected for' i.e. have an advantage.

Note: Using glyphosate weedkiller in fields of GM Bt. maize kills milkweed plants where monarch butterflies lay eggs → extinction.