

Part 5: Advantages and Limitations

7. Identify one advantage and one limitation of each method:

Method	Advantage	Limitation
Crossbreeding		
Genetic Modification		

Part 6: Think Like a Scientist

8. Which method seems more **controlled**? Why?

9. Which method seems more **natural**? Why?

10. If you were a farmer, which method would you trust more? Explain your reasoning.

How to Build a Better Plant

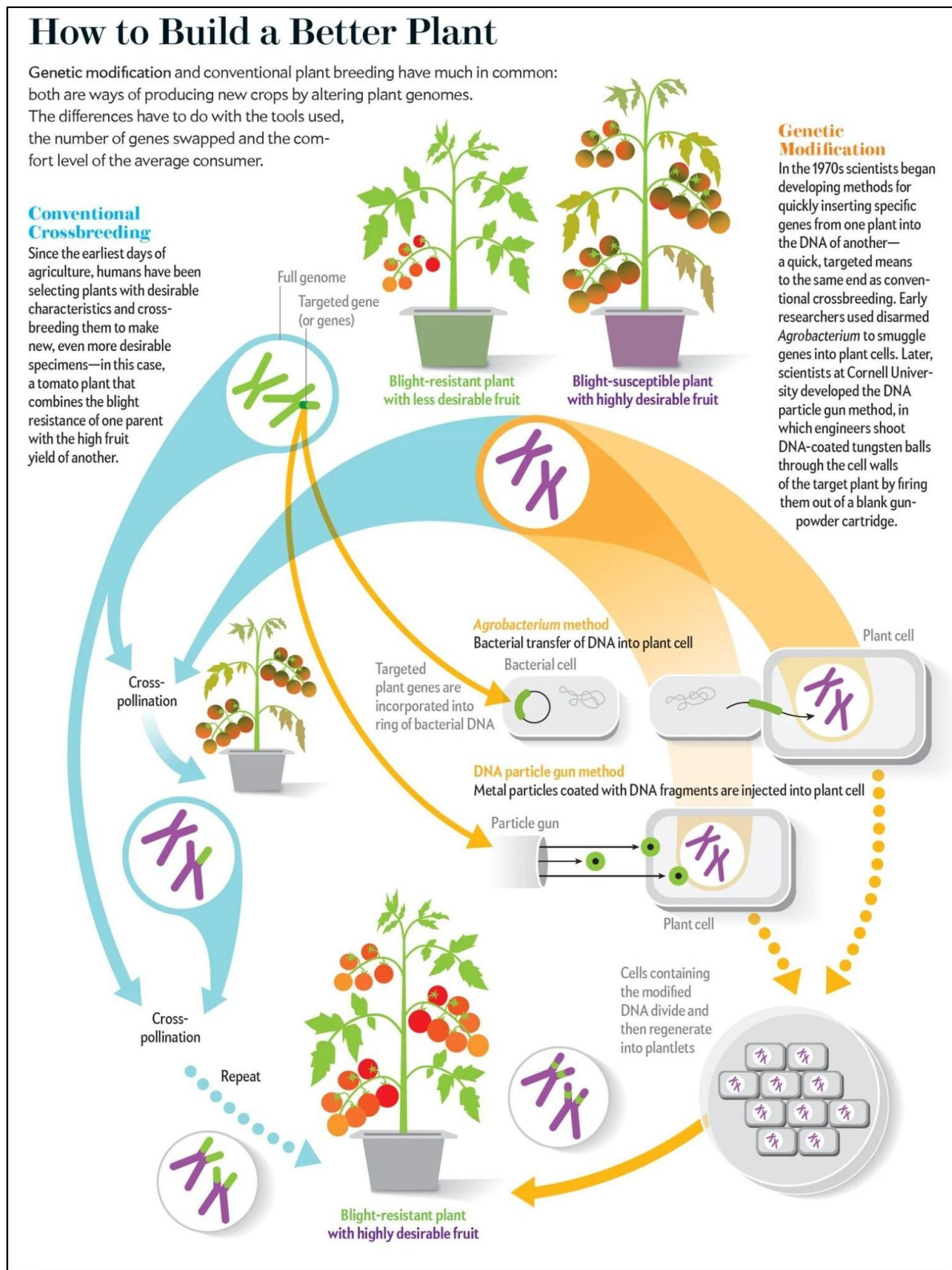
Genetic modification and conventional plant breeding have much in common: both are ways of producing new crops by altering plant genomes. The differences have to do with the tools used, the number of genes swapped and the comfort level of the average consumer.

Conventional Crossbreeding

Since the earliest days of agriculture, humans have been selecting plants with desirable characteristics and crossbreeding them to make new, even more desirable specimens—in this case, a tomato plant that combines the blight resistance of one parent with the high fruit yield of another.

Genetic Modification

In the 1970s scientists began developing methods for quickly inserting specific genes from one plant into the DNA of another—a quick, targeted means to the same end as conventional crossbreeding. Early researchers used disarmed *Agrobacterium* to smuggle genes into plant cells. Later, scientists at Cornell University developed the DNA particle gun method, in which engineers shoot DNA-coated tungsten balls through the cell walls of the target plant by firing them out of a blank gunpowder cartridge.



Source: Christiansen, J. (2013). *How to Build a Better Plant*. [Image]. Scientific American. <https://www.scientificamerican.com/article/the-truth-about-genetically-modified-food/>