



Can GM food help end world hunger?



THE PROBLEM

Future food security is under threat due to increased demand as a result of rising populations. Also due to climate change and modern farming methods it may be harder to grow crops in the future. For example, extreme weather conditions such as floods and droughts are detrimental to crop yields. In addition, current farming methods make up 70% of water use and waste a large amount through inefficiencies. 33% of fertile land has also been lost due to pollution, over using fertiliser and erosion caused by deforestation.



60% increase in food demand by 2050



33% decrease of world's arable land

BT COTTON IN INDIA

90% of cotton currently grown in India is GM. Most of this is BT cotton which was approved in 2002 and has a biological pesticide that kills the crop pest bollworm.

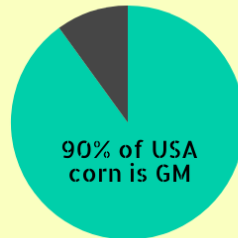
However, this has caused a few problems:

- cotton stopped growing and producing new buds and current buds stayed the same size
- the BT cotton consumed a lot more water
- €20mn loss in one cropping season



EU VS. USA STANDPOINT

- Despite EU scientists largely agreeing that GM crops are safe for humans and the environment, consumer activists often control the narrative
- The EU allows for the importation of 50 GM crop varieties. These, however, are exclusively used as animal feed
- Only one type of GM crop, a certain maize, is allowed to be grown in Europe
- In contrast, in the United States, nearly 90% of crops are genetically modified
- The GM market is monopolised by 6 main multinational companies which control 85% of the annual pesticide market valued at 30 billion US dollars



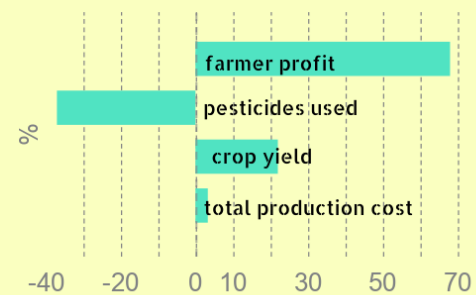
HOW GMOS CAN HELP WITH FOOD SECURITY

What is a GM Food?

GM food refers to foods such as crops whose DNA has been genetically modified for improved properties. Most modern genetically modified crops are created using CRISPR which is a naturally occurring system in bacteria that cuts DNA. When an artificially targeted piece of DNA is cut, a new sequence is inserted, then the cell will repair the DNA with the new, more desirable trait. The two most common characteristics of GM crops are:

- resistance to herbicides
- protection from insect infestation

How can GMO's help food security?



The graph above depicts the respective percentage increase/decrease of 147 farms in 2014 after introducing GM crops. As you can see, GM crops can help increase crop yields for a given land space. This is therefore profitable for both producers and consumers. However it is predicted that the benefits will reduce over time.

In addition to increasing production, GM crops can increase the nutritional value of foods as seen in Golden Rice which drastically increases Vitamin A levels in consumers preventing illnesses such as blindness.

“The countries that could benefit the most from genetic engineering have benefited the least”
- Diehl 2018

THE ETHICAL DEBATE

- Is GM food natural? Many pro organic organisations, including Greenpeace, argue that GM foods are fundamentally unnatural and thus harmful
- Many consumers fear that the large biotech companies which control the technology have too much power over the development of GM food
- GM crops may create a wealth gap, rendering farmers who do not have access to the technology redundant
- Due to the lack of understanding of the process and gaps in research, some consumers are fearful of the potential long-term effects



HOW COULD WE MAKE THIS VIABLE FOR FUTURE FOOD SECURITY?

In order to use GM crops to help solve the major food crisis, we need to make sure we are utilising them in the best possible manner which includes:

- **Improving access:** At the moment, only a few large companies in developed countries are able to use this technology. In order to help the countries with the largest hunger problems, the technology needs to become more affordable and available to the developing world.
- **Investment:** There needs to be larger investment in research in the public sector, shifting the focus from profits to well-being.
- **Public Interest:** Agricultural development must be regarded as critically important by the general public if an agricultural revolution is to be sustained.
- **Regulation:** Developing world policy makers must consider the risks as well as the benefits in setting GMO regulation.



CONCLUSION

GM crops have the potential to help our world tackle its food security challenge. In order for society to utilise the technology to its full potential, we need to ensure that the technology is properly managed and that consumers are sufficiently educated.

