

THE ISSUES SURROUNDING GENETICALLY MODIFIED AGRICULTURE

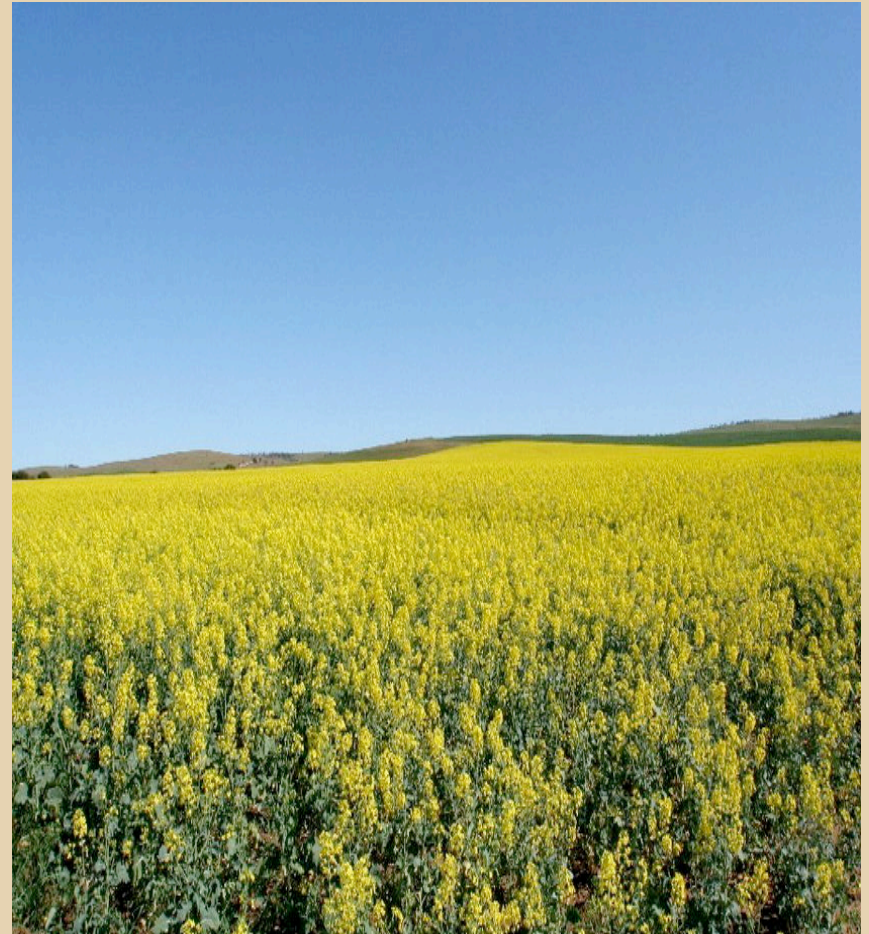


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What are Genetically Modified Organisms (GMOs)?

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- GMOs are basically organisms that have been genetically engineered to express a foreign gene in order to produce a specific type of protein.
 - Examples: Bt canola, which expresses the gene for the bacterial toxin: *Bacillus thuringiensis*



Why the need for GM Agriculture?

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- June 1962, Rachel Carson published *Silent Spring*
- Increased public awareness about the toxicity of pesticides
- This caused a huge decline in pesticide sales and pesticide giants such as Monsanto were forced to develop a more eco-friendly product.
- Became one of the main reasons for the development of biotechnology



Biotechnology

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- Scientists discovered the mechanism by which *Agrobacterium tumefaciens*, (a parasitic soil bacterium), genetically modifies its host.
- The gene gun – fires bullets (tiny gold or tungsten pellets) into cells. The bullets are affixed with the desired genes.



The Good

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- Genetically modified crops have helped to reduce our dependence on chemicals that are harmful to our environment such as herbicides and pesticides.
- Examples: Bt crops: soy, cotton, corn.



A field with non-Bt cotton on the left and Bt cotton on the right.

The Good

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- Genetic modification allows us to bring more desirable product to market such as fruits and vegetables with a higher nutrient content and longer shelf life.
 - Examples: Golden Rice
- There have also been efforts to engineer a vaccine delivery system through genetically modified bananas for use in third world countries that lack the proper equipment or storage facilities for vaccine distribution.



The Bad

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- There are fears that genetically modified foods may be harmful to the environment. GM crops might spread their genes to organisms that were never intended to have them.
- There are also health concerns because few studies have examined the long term effects of consuming genetically modified crops.



The Bad

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- There are also fears of introducing potential allergens into genetically modified foods
 - Example: genetically modified soybeans that contain Brazil nut protein



Conclusions

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- GM crops have shown to provide numerous benefits to humans with regards to food production but their safety will continue to be widely debated until the government is able to prove the safety of such products.
- Within a decade or so public concern should lessen as more information becomes available and the risks are assessed.