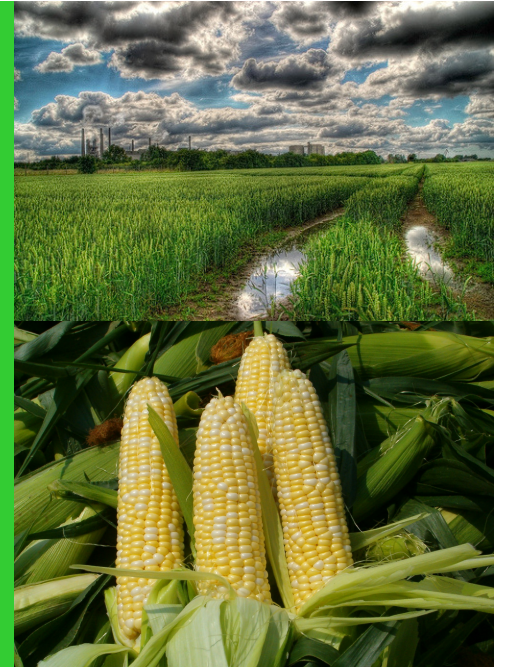


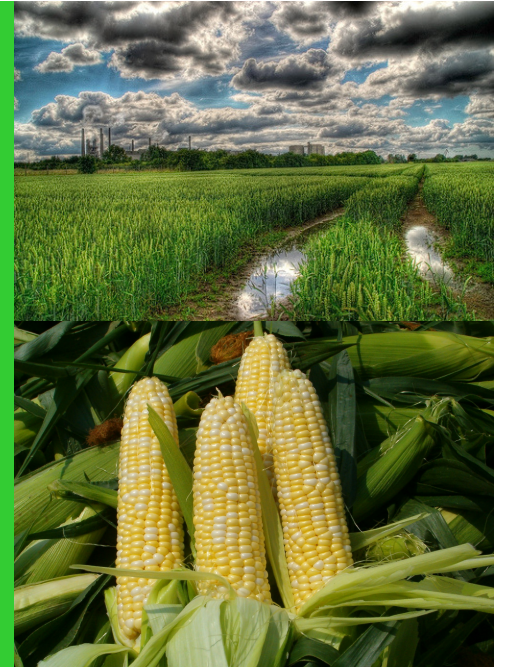
Genetically Modified Organisms

Environmental Science
Period 6



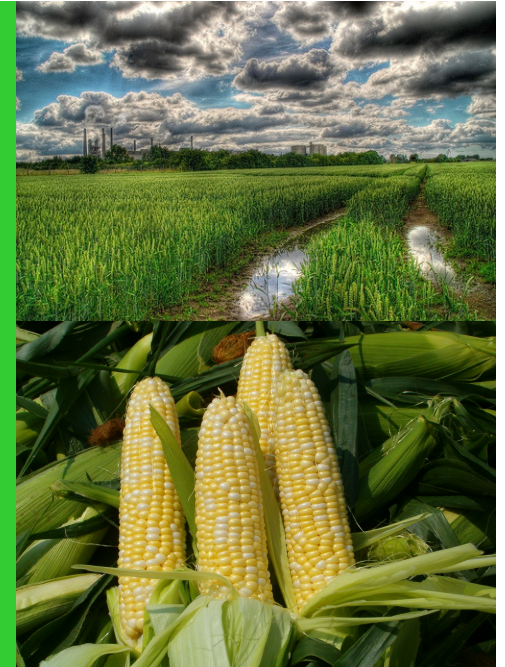
GMO

- Genetically modified organism or a transgenic organism
- Biotechnology companies have been creating these GMOs for at least two decades
- Refer to a living organism that has been genetically altered using molecular genetics techniques such as gene cloning and protein engineering.



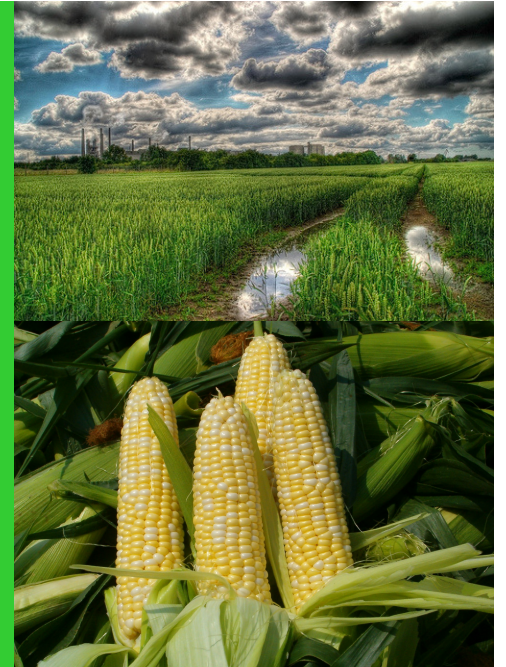
Early manipulation

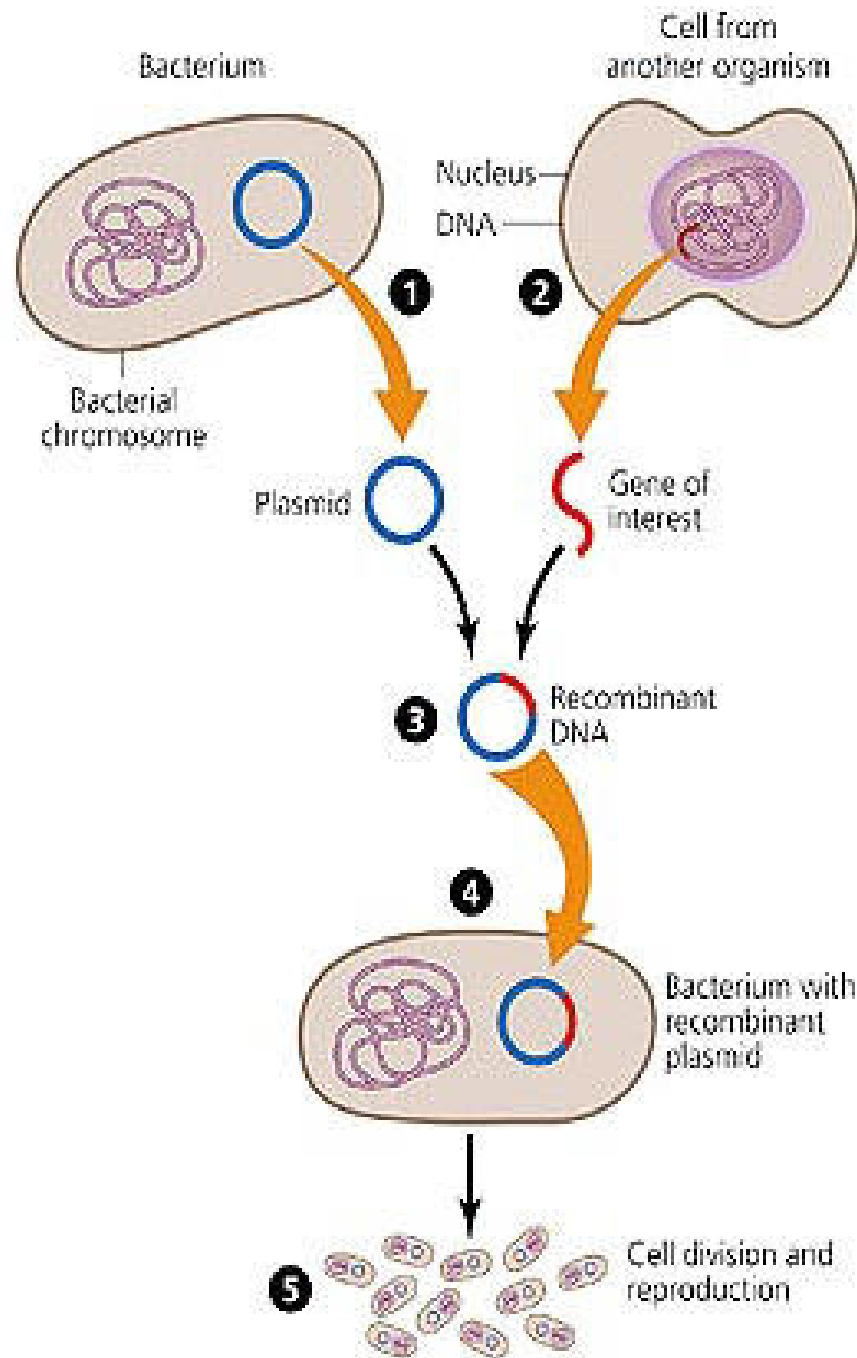
- Farmers have been manipulating agriculture genes for hundreds of years
- The original tomato no longer exists



Basic Creation

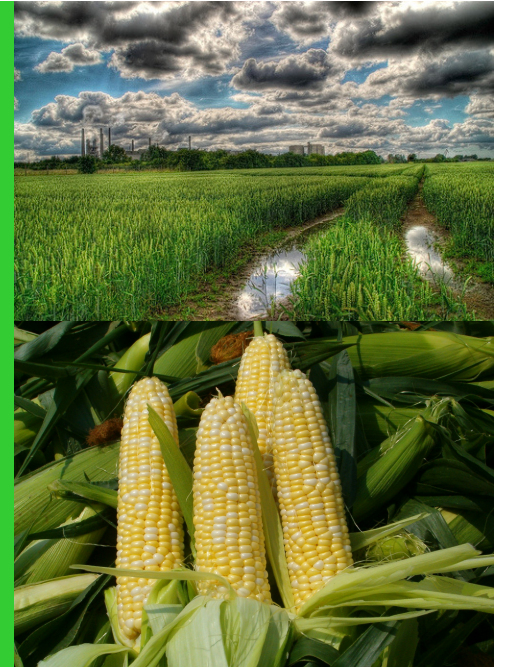
- Take a particular gene from one organism
- Insert that gene into another organism
- That second organism grows exhibiting the effects of that transplanted gene





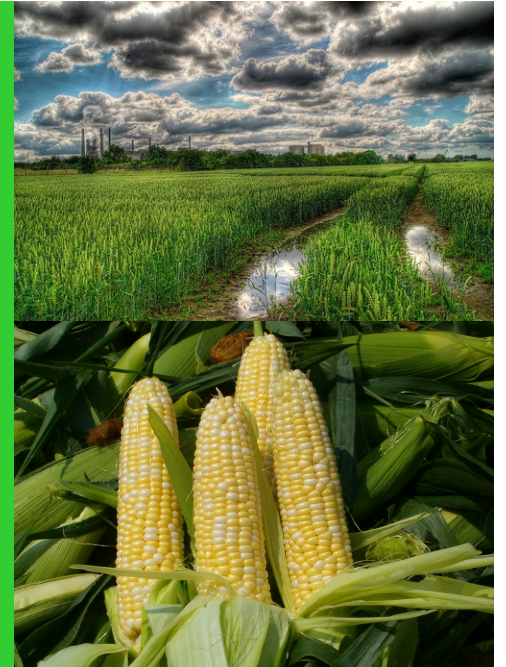
Why do this?

- Increased resistance to herbicides
- Increased nutritional content
- Increased tolerance to weather conditions



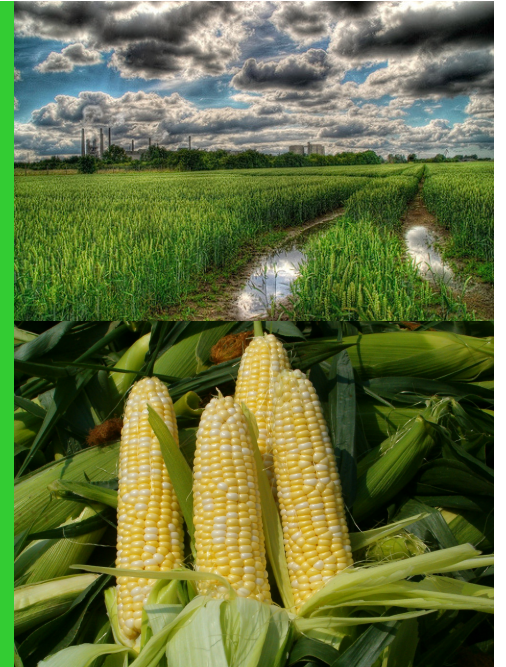
Conventional farming v. GMOs

- Conventional farming can produce some of the same results, but it is a trial and error process
- By genetically modifying foods, we can be more accurate in our selection of traits



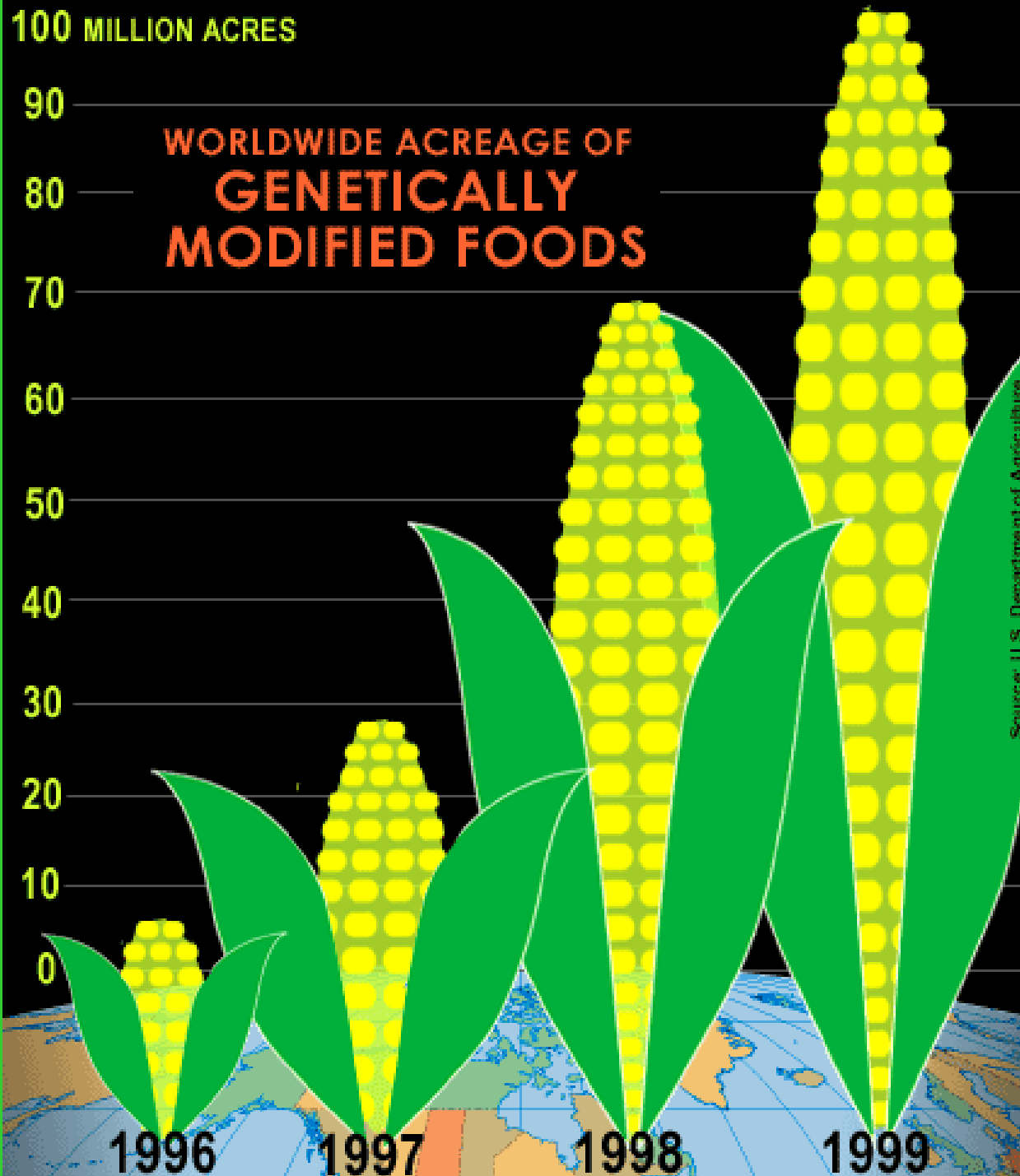
Where

- First commercially available in the 1990s
- By 1998, 50% of the US soybean crop was genetically modified
- 90% of Canada's canola oil crop was genetically modified
- By 2000, 68% of all GM crops were grown by US farmers



100 MILLION ACRES

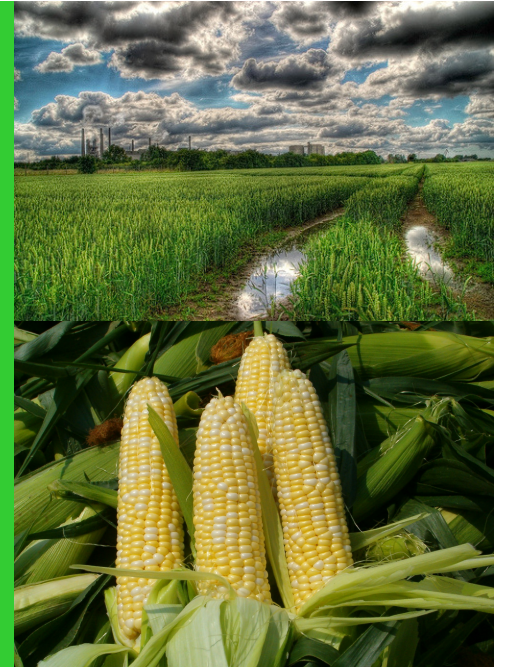
WORLDWIDE ACREAGE OF GENETICALLY MODIFIED FOODS



Source: U.S. Department of Agriculture

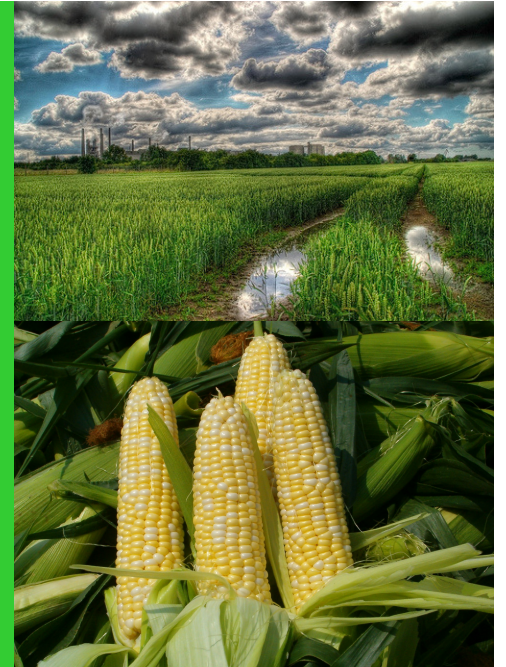
What GMOs could do

- More accurate modification by a farmer
- Reduce the use of pesticides
- Feed the hungry
- Promote biotechnology



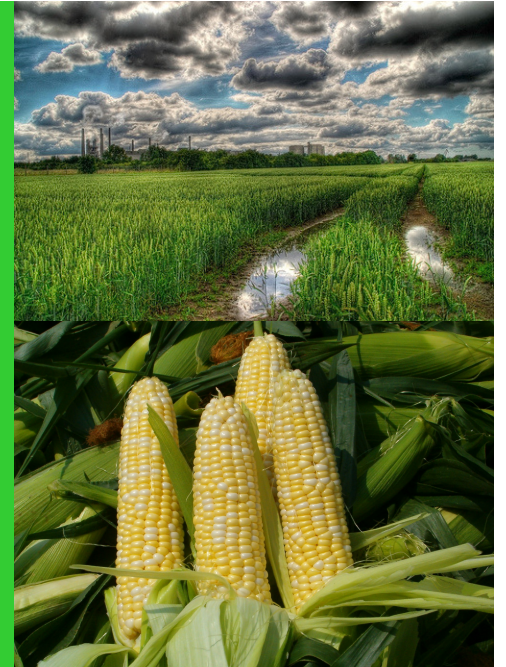
What GMOs could do

- Give us cheaper, tastier and more nutritious foods
- Provide jobs
- Increase America's power in the scientific community
- Medicine → edible vaccines



What GMOs could do

- Phytoremediation → cleaning up the environment
- Disease-resistant crops
- Drought-tolerant crops

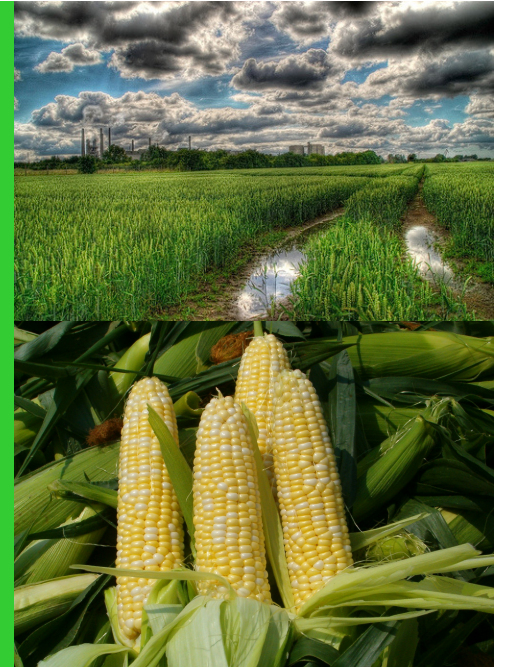


Monsanto Corporation

- <http://www.monsanto.com/video/default.asp>

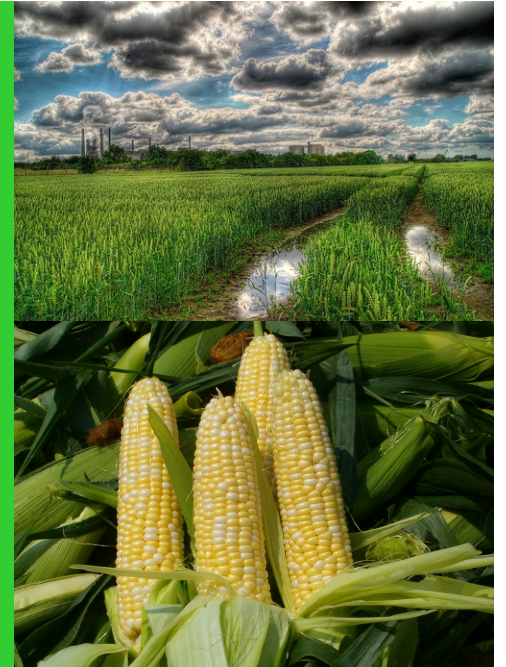
Risks

- Health issues
- Environmental issues
- Economic concerns



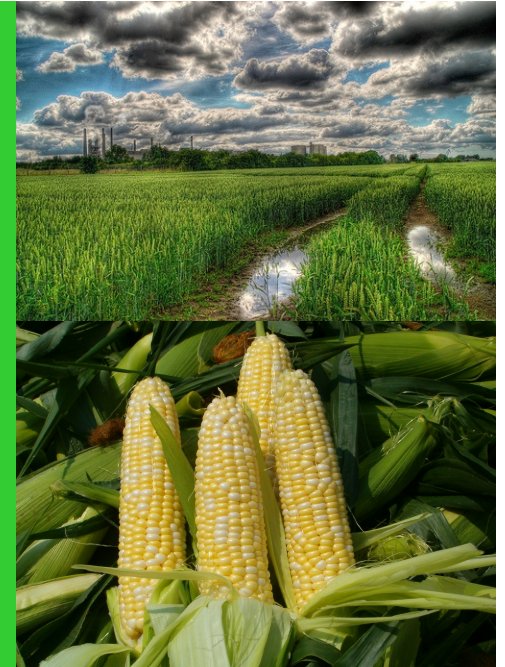
Labeling

- The US government does not regulate or label GMO crops (40 plant varieties)
 - FDA = treated GMOs as conventional crops
 - USDA = did not comprise a new variety of hybrids
 - EPA = could regulate plants that pose an environmental risk
- No additional framework was added with the mass production and commercial use of GMOs



Frankenfoods

- Europeans fought back against biotech companies like Monsanto



Prince Charles

- http://news.bbc.co.uk/2/hi/uk_news/7559353.stm



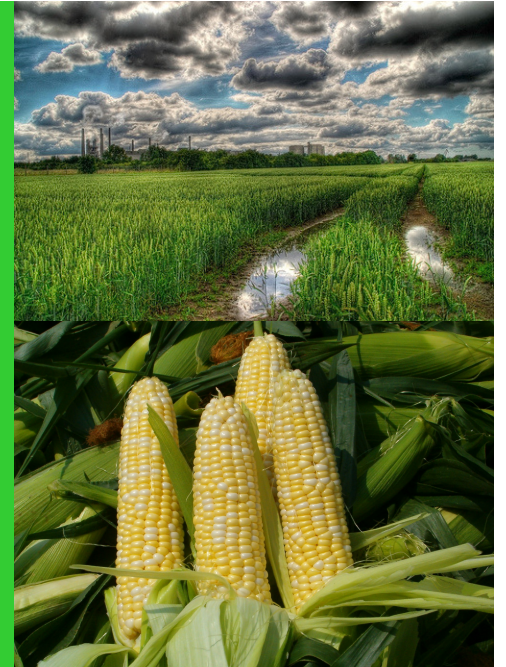
People worry about the limits of what this technology can do. How much is too much?

Genetically modified goats

- <http://planetgreen.discovery.com/video/?playerId=1488687257&categoryId=1618699938&lineupId=1612732350&titleId=1618678475>

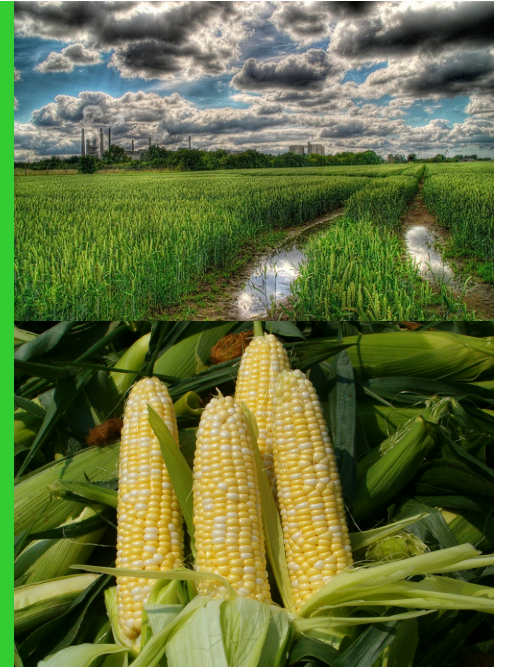
Health Issues

- Allergic reactions to transplanted genes
- Unknown effects???
- Rat study



Contamination

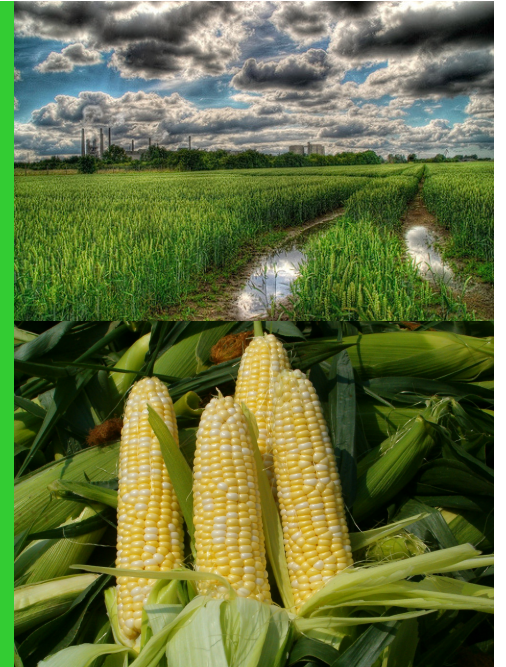
- There is a growing concern that there will be cross-breeding between GMOs and organic crops
- Study done in Mexico showed extensive contamination
- “Pollen knows no bounds”





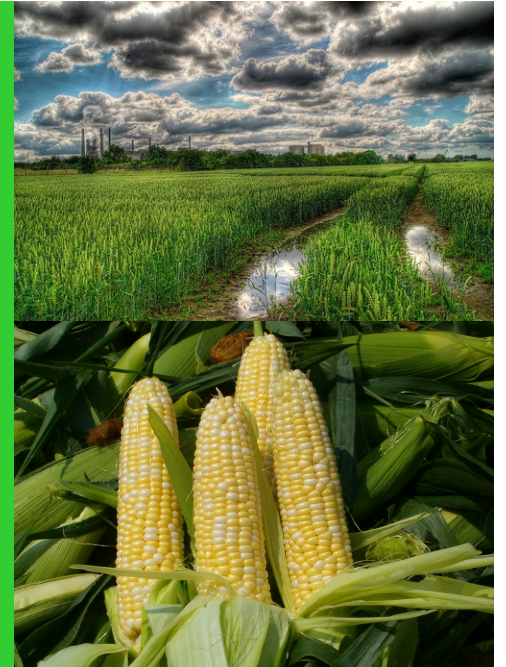
Bt Crops

- Bt crops were created by Monsanto Corp. and mass-marketed in China
- Reduced production costs and increased yield
- Killed more than the intended insect including the Monarch butterfly



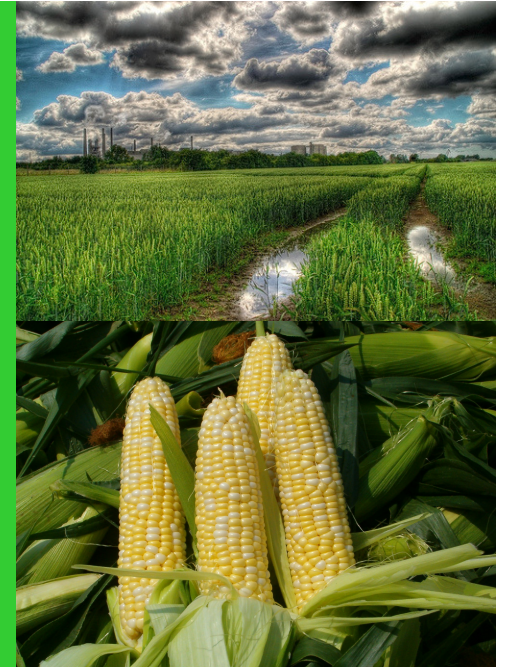
Gene Transfer

- Resistance could occur reducing the effectiveness of these GMO crops
- Gene transfer to non-target species



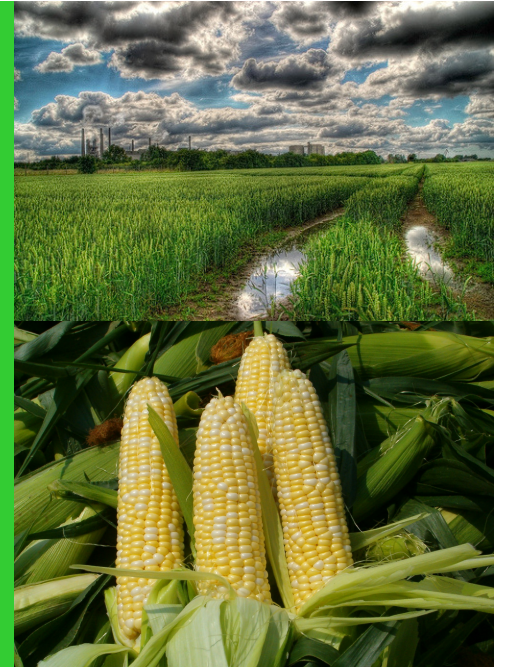
Patents

- Biotech corporations patent these GMOs



Profits

- Due to patents, biotech companies, like Monsanto Corp., can make a lot of money on the sale of their seeds
- Monsanto can sue farmers for contamination (intellectual property rights)



U.S. CONSUMER

WHY AUTHORIZE UNPROVEN, UNSAFE, GENETICALLY ALTERED FOODS? TO ALLEVIATE WORLD HUNGER, THAT'S WHY!

MORE!

FDA

GMO PROFITS

AGRIBIZ

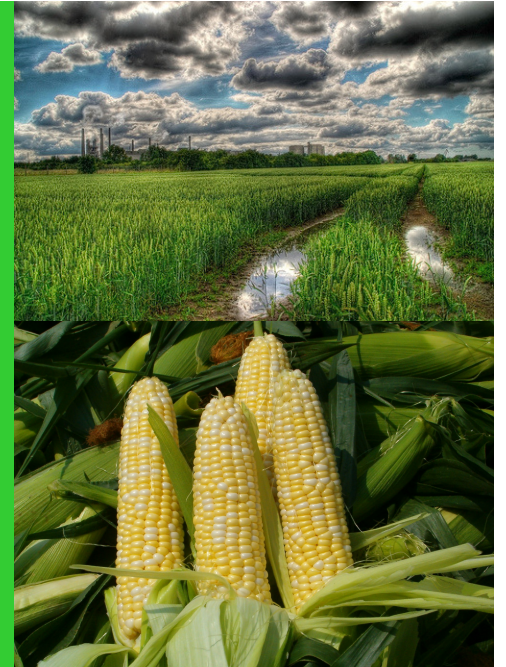
DON'T KNOW IF ANYTHING CAN ALLEVIATE THIS GUY...

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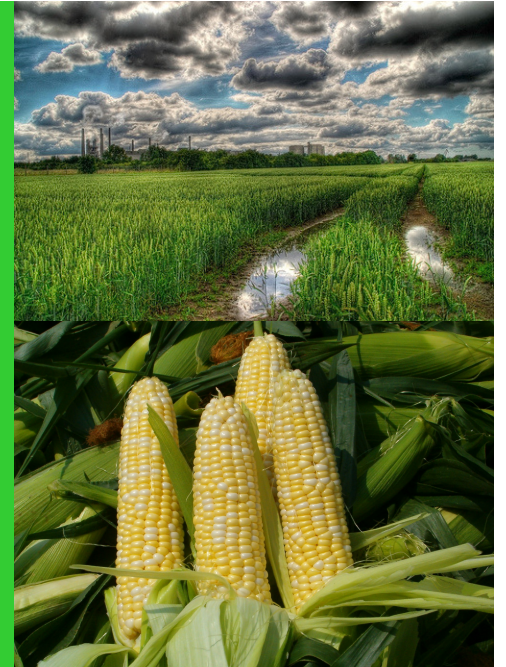
Incentives

- Incentive to create a safe product for those that can purchase their seeds
- No incentive to cater to those that cannot afford their product



Suicide Genes

- Monsanto and other corporations are looking into suicide genes
- The plant would only be viable for one growing season
- Farmers would have to purchase seeds each year
- Profits for corporations What about farmers?



Discussion

- Let's here your thoughts

