

# Non-GMO

STEVE MCKASKLE

rice farmer

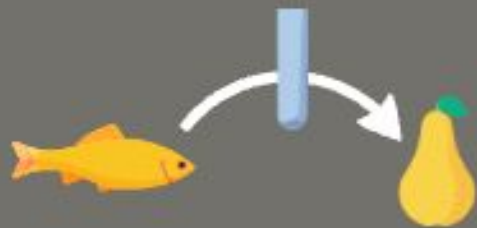
steve's family grows organic white and brown rice for regional chipotle locations. they've shown incredible resilience weathering a tornado and losing their entire livelihood, yet still stuck to principles in growing only organic crops destined for an ethical business. they also avoid farming in monocultures by diversifying with organic corn, soybeans, winter wheat, and oats. and though he's the only organic farmer in the area, he's encouraging his neighbors to do the same!

# Non-GMO

I've been wanting to learn more and create my own presentation on GMOs for awhile so I made my own kind of infographic to explain what I'd researched to my peers.

## Genetically Modified Organisms

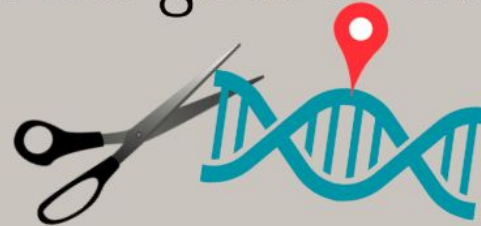
Selective breeding has been used for centuries to take the best naturally occurring traits within a plant species and combine them to create larger, hardier crops.



Genetic modification refers to the transfer of specific genes from one organism to another, often breaking the "species barrier" by recombining DNA from different organisms.

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1. Restriction enzymes cut out the gene of interest and open up a bacterial plasmid.



2. DNA ligase binds the gene within the plasmid (along with kanamycin, or another gene for antibiotic resistance).



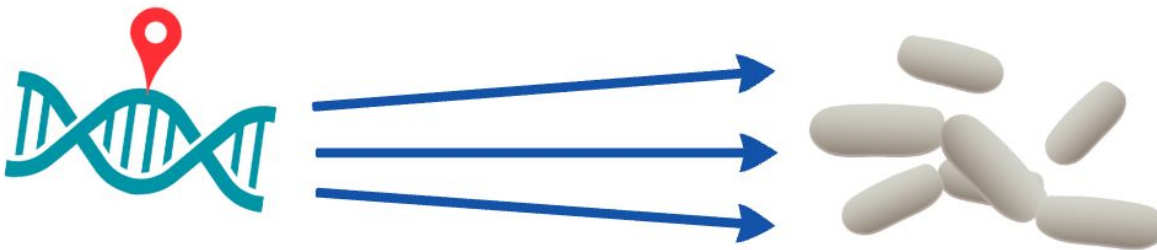
3. Plasmids (taken from the tumor-inducing, pathogenic bacteria, *Agrobacterium tumefaciens*) are introduced and recombinant cells are selected via antibiotics.





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OR, genes are bonded to molecules of gold or tungsten and projected at a culture of embryonic cells



the issue with this is that they are inserted at **random**, which means (a) there is an extremely low chance of success, (b) it is highly invasive killing most recipient cells, and (c) the effects on protein synthesis are nearly impossible to ascertain.

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## So what are the risks??

- unknown side effects of new protein interactions (e.g. producing toxins) 
- antibiotic resistance in bacteria inevitably leads to stronger bacteria over time (superbacteria? :o ) 
- decrease in biodiversity when a "successful" crop takes over, leaving us vulnerable to disease 
- physiological differences and increases in nutrients required to produce the same yield 

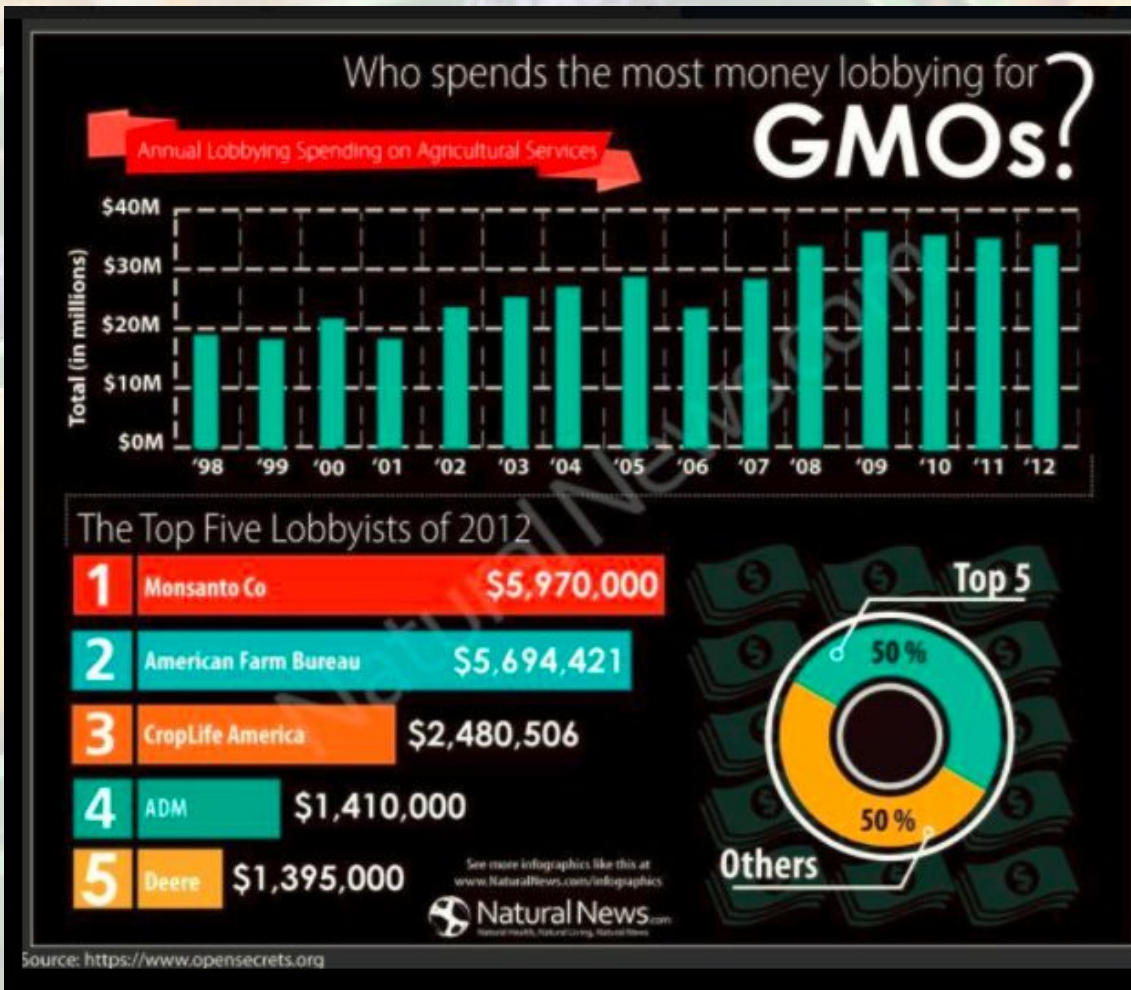
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## Takeaways:

- After a ton of research... be wary of the first source you come across; it can bias you against all future ones.
- Do your own research. Be willing to acknowledge what you don't know instead of arguing opinions as facts
- GMOs deserve every bit of skepticism and distrust they receive. But that's because basically all the GMOs out there are made by large biotech companies. Are they inherently evil? Science does not seem to think so, and neither do I, though Monsanto and many of its creations certainly are.
- There are higher and lower risk ways to genetically modify organisms. While I don't trust either, I trust the plasmid method more than the gene gun.
- Even "success stories" like golden rice have sinister endings--golden rice takes about twice as much fertilizer to grow, making it all but useless for the developing countries it was made to help.
- There are horror stories out there. Reading about Monsanto's "Seeds of Suicide" made me *furious* that such GMOs are allowed on the market.



# Non-GMO



<https://docs.google.com/spreadsheets/d/1HAZlPAVZU0v10400UZDv1tAM019L13CvY0z10/>

**Travis Kwee**  
11 mins · 📍 · ⌵

Regardless of where you stand on GMOs as a whole, I think we can all agree that it's ridiculous and unethical for Monsanto et al spend upwards of \$35 million a year just to keep us in the dark. So when it comes to two choices within my price range, I think I'll go for the safer option in the Non-GMO brands.  
#PGC2017 Turning Green @rwgarciasnacks @nongmoproject @usrightoknow @gmoinside #nonGMO

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