



**Fair World Project  
Technology Fact Sheet**

**What are GMOs?** GMO stands for genetically modified organism and refers to the technology in which a gene from one organism is inserted into another organism to give it a new trait. In agriculture, some of the most common GMO crops are corn, soy, canola, and cotton and the most common traits include genetic modification to tolerate application of herbicide or to produce their own pesticide.

**What is synthetic biology (synbio)?** Synthetic biology, also called extreme genetic engineering, is the technology in which a new gene is created and printed using a 3-D printer, then inserted into yeast or algae to “instruct” the yeast or algae to convert sugars to new products such as specific oils, flavors, or fragrances.

**What is nanotechnology?** Nanotechnology is the technology used to create nano materials, that is particles in the nanoscale range where they are small enough to pass through cell membranes and they often behave differently than their macro counterparts. Nanoparticles are currently found in processed foods, cosmetics such as sunscreens, and food packaging and cookware.

Key: \$=Economic +=Health Red indicates high risk. Yellow indicates medium risk. Blue indicates low risk. Green indicates no risk.

| Technology | Risk to Farmworkers | Risk to Farmers | Risk to rural communities (risk to people who live near farms) | Risk to Food Processing Workers | Risk to Consumers | Risk to Environment |
|------------|---------------------|-----------------|--|---------------------------------|-------------------|---------------------|
| GMOs       | \$ +                | \$ +            | \$ +   | \$ +                            | \$ +              | \$ +                |
| Synbio     | \$ +                | \$ +            | \$ +   | \$ +                            | \$ +              | \$ +                |
| Nano       | \$ +                | \$ +            | \$ +   | \$ +                            | \$ +              | \$ +                |

### Some facts:

- Though promoted as needed to feed the world, most GMO crops are created to produce pesticides or withstand toxic chemical spraying, not to create better yields or nutrition, and are consequently more prevalent in the Global North.
- Because of the prevalence of crops, like soy, engineered to withstand herbicide spraying, the use of toxic agriculture chemicals has skyrocketed on farms. Glyphosate, the active ingredient in Monsanto's Round-Up, has recently been linked to cancer, and is one of the toxic chemicals in heavy use on GMO crops. This is bad news for the farmers and farmworkers who handle the toxic herbicides as well as farming communities and the environment where the chemical is used.
- GMO seeds are patented, which means farmers cannot save them, violating basic rights of farmers and food sovereignty principles.
- The most lucrative and viable synbio products, flavors and fragrances such as vanilla and saffron, recreate some of the most lucrative specialty crops for farmers and therefore threaten farmers, jobs for farmworkers, and rural communities.
- Genetically altered yeast and algae cannot create new products in a vacuum, but require inputs of sugar, often itself GMO beet sugar or corn syrup or sugar from plantations created by the destruction of rain forests and reliant on cheap farm labor to produce.
- Nanoparticles, such as titanium dioxide and silver nanoparticles, are associated with health risks including effects on brain, lungs, reproduction, and cell damage. Consumers who ingest these ingredients are at risk, but food processing and manufacturing workers are likely at greater risk as they breathe and handle such ingredients at high concentrations for long periods of time.
- Nanoparticles used in agriculture as pesticides are lighter than other pesticides and drift may travel further, endangering rural agriculture communities; fertilizers may damage soil structure in the long-term.
- None of these technologies are properly regulated by the government or tested for health and environmental impacts, nor are they labeled as containing and created through GMO, nano, or synbio.

### Sources of our information and for you to learn more:

GMO frequently asked questions: <http://www.nongmoproject.org/learn-more/>

"Herbicide and Insecticide Use on GMO Crops Skyrocketing While Pro-GMO Media Run Interference" <http://fairworldproject.org/voices-of-fair-trade/herbicide-and-insecticide-use-on-gmo-crops-skyrocketing-while-pro-gmo-media-run-interference/>

"WHO Report Links Ingredient in Roundup to Cancer" <http://www.nytimes.com/2015/03/21/business/who-report-links-ingredient-in-roundup-to-cancer.html>

"Spilling the Beans: Unintended GMO Health Risks" <https://www.organicconsumers.org/news/spilling-beans-unintended-gmo-health-risks>

"Extreme Genetic Engineering: An Introduction to Synthetic Biology" <http://www.etcgroup.org/content/extreme-genetic-engineering-introduction-synthetic-biology>

"Synthetic biology: GMOs 2.0" [http://webiva-downton.s3.amazonaws.com/877/88/b/5292/Issue\\_brief\\_-\\_Synbio\\_GMOs\\_2\\_2015.pdf](http://webiva-downton.s3.amazonaws.com/877/88/b/5292/Issue_brief_-_Synbio_GMOs_2_2015.pdf)

"Synthetic biology vanilla: 'natural' and 'sustainable'?" [http://libcloud.s3.amazonaws.com/93/a2/1/4914/Issue\\_brief\\_-\\_synbio\\_vanilla.pdf](http://libcloud.s3.amazonaws.com/93/a2/1/4914/Issue_brief_-_synbio_vanilla.pdf)

Nanomaterials fact sheet: <http://www.iatp.org/files/Nano%20Fact%20Sheet%2020150309.pdf>

"Tiny Ingredients, Big Risk" [http://libcloud.s3.amazonaws.com/93/25/c/4723/2014\\_Tiny\\_Ingredients\\_Big\\_Risks\\_Web.pdf](http://libcloud.s3.amazonaws.com/93/25/c/4723/2014_Tiny_Ingredients_Big_Risks_Web.pdf)

"Nanotech Risks to Soil Health" <http://www.iatp.org/documents/nanotechnology-risk-to-soil-health>