

GE Crop Challenges in the United States

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[World and U.S. List](#) [Complete Technical List](#)

7 GEO Commercial Traits: Patenting Life for Profit

[Abiotic Tolerance](#) [Altered Growth/Yield](#) [Disease Resistance](#) [Herbicide Tolerance](#) [Insect Resistance](#) [Pollination Control](#) [Product Quality](#)

(GEOs are very unstable and risky forms of GMOs.)

15 Major Challenges

Many difficulties persist today surrounding genetically engineered (GE) crops in the United States:

Introduction

There are seven major types ([commercial traits](#)) of GE crops. They are designed primarily for optimal corporate profits with very little benefit to (and typically a negative impact on) small farms, our environment, and consumer health. To make matters worse, the U.S. has never developed federal regulation specific to genetically engineered organisms (GEOs) for human-safety protections. Currently, GEOs are regulated under completely outdated, ineffective, convoluted, and confusing regulatory standards further discussed in this article. [34,55,56]

The problem with GEOs originates with the fact that agricultural biotech research and development is based firmly and foremost on profit-margins. Data they supply to government, for safety purposes, is not based entirely on “precautionary principles” highly guarded by the independent scientific community. As a result, independent, peer-reviewed scientific literature plainly shows conventional GEO farming degrades human health, disrupts agricultural sustainability, pollutes the environment, produces relatively equal and often less crop-yields than organic (non-GEO) farming, produces a highly inferior product (poor nutrition and increased toxic-load), promotes excessive herbicide crop residue (due to herbicide tolerant GEOs), erodes the small farmers’ freedom, and corrodes their trust and interdependence. [55,56]

GEO farming practices are not just environmentally and culturally damaging. Various other independent, peer-reviewed research and scientific observations clearly demonstrate GE food itself produces unintended side-effects significantly disrupting the immune system, lungs, pancreas, liver, testes, blood, kidneys, stomach, intestinal tract, and causing unexplained death. Organic (non-GEO) farming is found not only to be more nutritious and nearly harmless (extremely low-risk) unlike conventional GEO farming, but more profitable for local family-farmers while creating a more sustainable source of food for communities everywhere. [3,4,11,16,17,19,21,23,27,28,29,35,38,57,58,59]

“Sustainable agricultural practices have proven beneficial in all aspects relevant to health and the environment. In addition, they bring food security and social and cultural well-being to local communities everywhere. There is an urgent need for a comprehensive global shift to [start producing] all forms of sustainable agriculture.”

[Independent Science Panel \(ISP\)](#)

1. Massive Profits Influence Policy: The United States chooses not to participate in a treaty of 170 nations called the [Cartagena Protocol on Biosafety \(CPB\)](#) by deciding not to ratify its signatory agreement (signed on June 4, 1993) with the parent organization [Convention on Biological Diversity \(CBD\)](#). “The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.” The CBD agreement has been under federal “review” for the past 23 years pending ratification. Evidence suggests this is because ratifying the agreement would largely obstruct profits in the agricultural biotech industry due to the CBD’s precautionary guidelines geared toward responsible GEO environmental health and safety standards. Even

the USDA has its own GE plum it is selling to farmers despite having no intentions of abiding by international GEO safety treaties. It's unfortunate, but this is a perfect example portraying how corporate and government profits are typically taken into consideration before the health and safety of the American people and the environment. Ultimately, the people have and will continue to suffer the massive health consequences attributable to these reckless governmental decisions. [25,39,47,53,54,55,56]

2. Lack of Regulation: Biotech corporations started experimenting with GEOs back in the 1970's when genetic engineering was relatively new to the scientific community. Although GEO agriculture was such a different form of agricultural technology, the USDA, EPA, and FDA regulators chose not to create new GEO regulations involving their impact on human health when introduced into the food-supply. Here's why: The first GEO was approved by the FDA in 1982 during the Reagan administration whose objective at that time was to loosen regulations on major corporations in hopes of boosting the economy. [55]

Currently, GEOs are regulated under the *Coordinated Framework for Regulation of Biotechnology (CFRB)*, established in 1986 and updated in 1992, but include no regulation specific to genetically engineered organisms (GEOs). GEOs are regulated under a completely outdated statutory authority designed to regulate conventionally modified organisms such as those produced using gene selection, hybridization, and induced mutation. Yet thus far, GEO foods on the market today are somehow considered to be "safe" by federal officials. The only federal GEO regulations today are under the *Animal and Plant Health Inspection Service (APHIS)* taskforce charged with *protecting American agriculture and natural resources*. They are not charged with protecting human health. The *Obama Administration issued a memorandum on July 2, 2015* putting pressure on the USDA, EPA, and FDA to create a new updated version of the outdated 1992 version of the CFRB to more effectively regulate GEO biotechnology for human safety in the U.S. [47]

Today, the *Federal Food, Drug, and Cosmetic Act (FD&C Act)* requires the FDA to properly label GEOs but they have not yet complied. This hasty and irresponsible decision has erupted into what we see today in the highly unregulated GEO industry — exorbitant corporate profits through the exploitation of food at the expense of life, liberty, and the pursuit of happiness by essentially owning (patenting) life itself. The GEO biotech industry claims to be serving the public with their “much needed” technology, yet almost all independent researchers worldwide plainly agree that GEOs and synthetic pesticides only serve one final end — to amass exorbitant corporate profits. Organic (non-GEO) products are proven to surpass conventional GEO and synthetic pesticide farming in almost every way. The agricultural biotech industry has become a parasite feeding off the misfortune of humanity and has *infiltrated federal regulatory agencies* in hopes of continuing their misguided profiteering. Even the USDA has created its first GEO crop, the *transgenic plum*. The public and the environment will continually suffer the long-term health consequences for many years if regulatory agencies like the FDA and USDA do not shape-up by enforcing current regulations, creating new GEO regulations protecting human health, and breaking ties within the agricultural biotech industry. [13,54,55,56,62,63]

3. Proven Health-Threat: Almost all independent researchers worldwide state that GEOs are “substantially different” from non-GEOs and can pose an unnecessary health-risk to the human population. As of the end of 2015, *38 nations* throughout the world have outright banned various GEO commercial crops. The evidence against GEOs is staggering. Many independent GEO animal-feeding studies and scientifically documented events clearly demonstrate GEOs pose serious health-threats including dysfunctions of the immune system, lungs, pancreas, liver, testes, blood, kidneys, stomach, intestinal tract, unusual abnormalities affecting every organ-system, unexplained death, and many other likely abnormalities (including neurological) if long-term human trials were carried out. Lastly, the impact of GEOs on mental health has never been studied by the U.S.'s mainstream scientific and government communities despite the fact mental health disorders have skyrocketed (e.g., autism, depression, schizophrenia, ADD/ADHD, Alzheimer's) in the past twenty years since GEOs became a common food-source. [3,4,11,16,17,19,23,28,29,35,38]

For GEOs to be legally sold as food in the U.S., the federal government does not require them to be tested for their health-effects on humans despite the highly synthetic process of gene manipulation. As long as

the biotech corporation's research concludes that their GEO product is "substantially equivalent" to the non-GEO counterpart, it can be "deregulated" for use as food for human consumption. Despite the abundance of worldwide impartial scientific literature stating that all GEOs are "substantially different" from non-GEOs, the agricultural biotech industry continues to convince the U.S. government that GEOs are as safe as conventional breeding and necessary for feeding the world's population. Hundreds of independent scientific studies suggest nothing could be further from the truth. [18,30,47,55,56]

4. Genetic Enslavement – An Ethical Dilemma: Although scientists understand very little about the origins of life (with no consensus on its method of creation or purpose), *The U.S. Supreme Court* has allowed corporations to patent (own) plant, animal, and microbial life if it is artificially altered for "useful" commercial purposes. *The U.S. Supreme Court's* ruling in 1980 on *Diamond vs. Chakrabarty* (setting precedence for GEO patentability) has misinterpreted the artificial manipulation of genetics as a "new invention" when human intelligence can only alter life and never "invent" life itself. This genetic enslavement allows for complete legal monopoly over a plant, animal, or microbe's genetics and endows complete power to enforce patent-infringement law on life itself. This power has even allowed the legal owner to confiscate all crops contaminated with DNA from the owner's patented GE seed or pollen. This leads to a major problem; genetic life essentially cannot be harnessed because it proliferates naturally so it's impossible to regulate. Genetic ownership is the complete objectification, manipulation, and enslavement of the building-blocks of life itself. So why are humans allowed to have complete ownership over GE life? The answer is quite simple: it's human greed, imprudent government policies, and corporate science gone awry. This is a major ethical dilemma allowing select wealthy corporations to manipulate genes creating genetic monopolies for financial purposes. Genetic life is a force freely endowed upon all humans, plants, animals, and other species. It is a sacred blueprint for what makes life possible. Ethically, genetics should not be owned by any person or corporation but to be cherished, respected, and shared freely by all living life-forms alike. [13,31,54,55,56]

5. Roundup Ready™ Wheat: Today, there are no GE wheat species approved for agricultural use worldwide so one would assume there is no GE wheat in U.S. agriculture. That is certainly not true at all. For years, agricultural biotech companies like *Monsanto, Inc.* have been cultivating experimental GE crops outdoors nationwide to carry out their crop experimentation. Covert GE wheat cultivation has been underway from the late 1990s up until today. Since 2004, despite Monsanto's halting of the USDA approval process for *Roundup Ready™ Wheat*, there have been official reports announcing *Roundup Ready™ Wheat* found growing in Oregon (2013), Montana (2014), and Washington state (2016). These were all accidental discoveries by local residents and not by regulatory inspection agencies which raises a major red flag as to how much of our wheat is actually GEO contaminated. This is strong evidence demonstrating our regulatory agencies' inability to prevent GE food-crops from contaminating our food-supply. This is a serious concern because once the GEOs' genetics are accidentally exposed to the agricultural ecology, it is impossible to completely extract their DNA from our food-supply due to natural methods of cross-pollination and seed distribution. This means our wheat in the U.S. is currently under major threat of GEO contamination. It is highly likely already contaminated significantly in various regions of the U.S. starting in the late 1990s when GE wheat experiments began. The wheat at greatest risk of GEO contamination is likely the organic wheat. The organic wheat farmers do not apply the toxic herbicide *Roundup™* (active ingredient: *Glyphosate*) to their wheat crops before harvest to force the [wheat to ripen uniformly](#) like many conventional farmers do in the U.S. This makes it extremely difficult to prevent *GEO Roundup Ready™ Wheat* from contaminating the organic wheat-supply. [32,36,45,66]

(Our full report found [here](#).)

6. Cross-Contamination: Land distance between GEO and organic (non-GEO) farmlands in the U.S. only require an unspecified distance "buffer zone" between croplands (§205.202 (C) [Land requirements](#)) rarely protecting against GE pollen and seed drift. Due to pollen and seed cross-contamination, almost all (even organic) sources of corn, soy, canola, and papaya are GEO contaminated while many sources of tomatoes, potatoes, chicory, apples, sugar beets (for table sugar), and even wheat are likely GEO contaminated. It is impossible to control for GEO cross-pollination and GEO natural seed distribution due

to wind, insects, birds, and other animals. Once a GE crop is let loose into the open agricultural ecology, there is entirely no method for absolute control over genetic proliferation and ultimately complete assimilation. Almost all GE crops produce seed or pollen and are a major threat to non-GE crops in the United States and thus are a serious threat to our organic food-supply nationwide. [15,54,65]

7. Profit-Driven Monopolies: By 2013, GE crops accounted for 90% of corn, 93% of soy, 93% of canola, 90% of cotton, and 95% of sugar beets (table sugar). Corn had the biggest increase from the year 2000 (25%) to 2013 (90%) at a 360% increase. Out of the 390 million acres of cropland in the U.S. in 2012, almost half (47% or 182 million acres) were planted with GE seed. And the percentage has only increased steadily ever since. Biotech agricultural companies (primarily *Monsanto inc.*) already have a monopoly on crops in the U.S. as the majority owner (51%) of the genetics of all seeds grown in the U.S. Most countries in the *European Union* do not allow monopolies on food-crops. More than half of these countries have banned GE crops for a variety of reasons including the dangers of food monopolies. For thousands of years, seeds were saved by farmers for the following year's crop. If GE seeds are saved, farmers are often sued for patent infringement. Most GE seed contracts limit the farmer's legal right to sue and often removes their right to sue under their own state law. The U.S. government has allowed corporations in the U.S. to have a complete monopoly over our crops. And the U.S. government is clearly shown to be complicit while openly boasting its approval of the GEO takeover of our agricultural food-supply. [22,48]

8. Horizontal Gene Transfer and Recombination: It's important to understand that all food is life comprised of a very complex arrangement of billions of living or once living cells. To illustrate a cell's genetic complexity, each individual human cell contains a particular person's entire genome (architectural drawing) comprising 23 chromosomes, many DNA strands totaling approximately 2 meters in length, and about 20,000 genes. Life is so intricate that the DNA strands in all the cells inside an average adult human body would stretch approximately one billion miles past Pluto ($37.2 \text{ trillion cells} \times 6.56 \text{ ft. DNA per cell} / (5,280 \text{ ft.}) = 4.62 \text{ billion miles}$). And plants are many times more complex genetically! [6]

All organisms conceptualize life-forms in terms of their genetic makeup (genome) and we all reside within our own genomic organism known specifically as a hominid species. The *World Health Organization (WHO)* expressed concerns regarding GEO genetic transfer to other species through natural means creating unrestricted dangers. Scientists create GEOs by "artificially" extracting genetics from one species' DNA (often a bacteria or virus) and forcing them into another species' DNA to recombine "artificially." This is a very expensive and tedious process called "synthetic" *horizontal gene transfer (HGT)*. The synthetic extraction and recombination of genetics is known to create GE species with highly irregular characteristics or behaviors. Scientists today have an extremely limited knowledge of how genetics function and their interaction with other species' genetics. Every passing day, scientists are learning more about genetics. According to the latest research, snippets of genes from one organism can be incorporated into the genetics of another living organism through the consumption of that organism (as food). This is a process of HGT through the use of microRNA aiding in one gene's "[epigenetic expression](#)" brought about in another species. [1,10,14,20,28,46,50,52,54,67]

When consuming GEO genetics and HGT occurs naturally inside our bodies, serious health-risks exist. Select microRNA of "corrupt" GEO genetics can then be transferred into our own human genome and (more frequently) into the genome of our gut microbiome. Scientists are still trying to understand which pieces of microRNA are transferred from one species to another and why. The health-threats resulting from GEO microRNA mediated HGT are literally astronomical and completely unknown. Because all genetic life is more interconnected than scientists had ever imagined previously, GEOs have the capacity to severely "synthetically" damage not only our own genetics but corrupt and pollute the vast genetic ocean of all living species on earth. [1,28,50,52,54,67]

The natural adaptation of all genetics is the quintessential standard for life and the basis for who we are and who we will become as a human species. Nature has developed an intricate systematic process of combining genes through procreation among same or similar genetics to adapt and evolve throughout the past 4 billion years. This occurs through *vertical gene transfer (VGT)*. It is an extraordinarily complex

process that all scientists understand very little about. And even fewer scientists understand the massive complexity surrounding microRNA mediated HGT and its involvement in the evolution of all plant, animal, human, and microbial species throughout the last 4 billion years. Corporate scientists today claim artificially forcing HGT to occur across species “synthetically” (creating a GEO) is without extreme risk; that is completely asinine. When a life-form consumes another and microRNA mediated HGT occurs, it then systematically adopts select snippets (traits) of that microRNA genetic-code into its own genome in the appropriate location and sequence. When plant, animal, and microbial genetic-codes are “artificially” forced to undergo HGT with another plant, animal, or microbe, there are likely to be highly destructive incalculable genetic disturbances or mutations during forced recombination due to dangerous DNA-sequence malformations and truncations. That is a major risk we undertake when creating and then consuming GEOs as a food-source. [1,10,14,20,28,35,50,52,54,67]

9. People want Transparency: Among the general public and independent researchers alike, there is growing concern regarding the concealment of GEOs in our food-supply by federal government regulators. The bulk of U.S. residents want GEO labeling while many others want to ban GEOs from our food-supply altogether. The vast majority of developed nations lawfully require GEO labeling starting in the 1990s. Ever since, GEO sales have declined in those nations. The agricultural biotech industry sees GEO transparency as a threat to profits. Research shows when people are given the choice, they will typically choose the non-GEO option. Today, popular opinion is largely in favor of GEO labeling which runs directly contrary to our government’s wishes to continue the massive biotech corporate GEO concealment. Major biotech agricultural corporations have now patented (own) the majority of seeds in the U.S. and are making exorbitant profits while our government sits on the sidelines cheering them along boasting record sales of GEO seeds, GEO food-products, and GEO-related pesticides. This is all happening while the U.S. public is suffering the extreme consequences of severe chronic illness, diminished quality of life, and environmental contamination directly caused by GEOs and the destructive farming practices associated. [40,41,60,62]

10. Bt Toxin: Crops are commonly modified genetically to produce their own insecticides derived from the bacteria *Bacillus thuringiensis* known as Bt toxins. There are 8 GMO plant species with Bt genes introduced into their genome: Bt corn, Bt cotton, Bt eggplant, Bt poplar, Bt potatoes, Bt rice, Bt soybeans, and Bt tomatoes. In nature, bacterial Bt toxins are ubiquitous. But, Bt toxins produced by GMOs are modified by the plant to become significantly different from their original bacterial form. Within Bt GMOs, the Bt toxin is in its soluble and therefore biochemically active form unlike the deactivated form in the Bt bacteria. This renders the Bt toxin much more toxic. Independent research shows that GMO Bt toxins can cause human cell lesions, kidney cell death, damage to human red blood cells (*erythrocytes*), and are likely complicit in the honeybee collapse epidemic. Today, the scientific community is still accumulating data on the dangers of GMO Bt toxins. As of 2013, [seven countries](#) have banned not just the cultivation of GMO Bt crops but the importation of GMO Bt foods into their countries altogether due to their documented health-risks. [7,9,12,34,37,48,51,54]

11. Pesticide Tolerant: Crops are genetically modified to tolerate two groups of pesticides (herbicides and antibiotics) and promote their excessive application. Plants engineered to tolerate herbicides such as *glyphosate*, *glufosinate*, *sulfonylurea*, *dicamba*, and *2,4-D* promote the excessive application of these herbicides directly onto the food-crops causing high levels of pesticide residues to accumulate in our food-supply. Also, plants engineered to tolerate the antibiotics *glyphosate*, *hagromycin B*, *neomycin*, and *kanamycin* promote the excessive application of these antibiotics in agricultural soil resulting in diminished bacterial soil diversity and quantity. This bacterial decline impacts the plant’s ability to absorb nutrients from the soil because a diverse and abundant bacterial biome is necessary for effective nutrient conversion into bioavailable (useable) plant nutrients. This results in diseased, weakened crops decreasing the health-benefits of our food-supply (e.g., iron, sulfur, manganese, zinc, calcium, nitrogen) and eventually prompting the application of even more pesticides to eliminate other diseases attributed to nutrient deficiencies. [5,8,54]

12. Fail to Increase Yields: Large agricultural biotech corporations have convinced the U.S. government that GEOs are necessary to "feed the world" when evidence clearly proves definitively that organic non-GE crops actually yield more product especially during drought and excessive rain where GE crops have failed miserably. Many thorough studies have been carried out on this topic and findings show that traditional breeding practices (natural gene modification) are responsible for the majority increase in crop yields, not the "synthetic" genetic modification of crops producing GEOs. [21,27,54]

13. Fail to Decrease Pesticide Use: The most common pesticides in agricultural use today in the U.S. are herbicides including *glyphosate* (Roundup™), *glufosinate*, and *sulfonyleurea*. The majority of GE crops today are genetically modified to be tolerant to one of these three herbicides. While U.S. GEO crop production has risen dramatically over the past 20 years, pesticide use has not declined and continues on a steady pace of about 1 billion pounds per year of which (in 2014) about 250 million pounds (25%) was from *glyphosate* alone. The mass majority of pesticides are used on herbicide resistant GE crops that in 2013 composed 42% of all U.S. crops. [2,26,43,44,49,61]

14. Chemicals before Quality: Today, during the technology age, farmers have become more industrialized and conditioned to rely more and more on GE crops that require the heavy application of herbicides. Instead of laborious work, farmers often opt out of time-tested, age-old family farming practices and turn to commercial farming. Many farmers of the 21st century have lost the sacredness found historically in the farming profession by turning toward commercial farming practices that degrade the soil, contaminate food-quality, and devastate the environment by replacing wholesome labor practices with toxic herbicides and corrosive fertilizers. For example, by simply spraying toxic herbicides regularly on GE tolerant crops, it allows for less labor-intensive weeding which allows for a decreased workforce and decreased cost. Foregoing traditional farming practices might make jobs easier and save some money, but at whose expense? These practices greatly increase food-contamination through harmful pesticide residues in our food-supply. However, it is not completely the commercial farmers' fault. Farmers are taught GE crops requiring excessive synthetic pesticides approved by the FDA, USDA, and EPA are completely safe but unfortunately *all* synthetic pesticides and GE crops come with a price — [health deterioration and environmental decline](#). Nothing can replace good old-fashioned hard work especially synthetic pesticides that cause disease even when applied at extremely low concentrations ([less than .1 ppb](#)) [54,55,56].

15. Unsustainable: GE crops promote high doses of synthetic pesticides severely disrupting the earth's ecosystem; they contaminate reproduction of natural crop species; they encourage weeds that are impervious to herbicides called "super weeds;" they have eroded trust between farmers; they have destroyed farming communities because of constant corporate fear tactics and surveillance. Lastly, GEOs destroy the integrity of humankind and our ability to respect and value life as more than merely "property for profit" but a source of life, health, and thanksgiving. [54,67]

Conclusion

There is a general consensus among independent scientists worldwide declaring genetically engineered life produces a high likelihood of "unintended effects" or unforeseen outcomes. This indicates there is a significant possibility of creating new synthetic species that have the potential to become an existential threat to human health, over decades to come, while likely severely damaging much of our earth's ecosystem. To support this conclusion, 297 independent European scientists, researchers, doctors, and academics signed a petition agreeing that there is "[No Scientific Consensus on GMO Safety](#)." In the U.S., this consensus has only grown significantly among independent scientific researchers yet not within our "mainstream" or "corporate Science" community today. [24,33,42]

Tampering with the building blocks of life can effectively mean we're experimenting with the future of life on earth. Worldwide, there are approximately 400 GEO plants and many other GEO animals. As more species are artificially genetically engineered, the unknown risks increase exponentially. This is largely because GEOs are often interbred (two or more GEOs) either in a lab or through uncontrolled natural outdoor pollination and fertilization. This is a major health concern because the unknown risks

increase considerably the more GEOs are produced with almost zero understanding of the long-term health implications. [54,66]

Synthetic products (e.g., GEOs and pesticides) *always* promote abnormal side-effects within humans, animals, plants, and microbiology (whether significant or negligible) that artificially interrupt the earth's natural biosphere despite the products' intended outcome. These side-effects may not be readily visible until decades from their introduction into our food-supply and the environment. All chronic diseases today are either caused or compounded by one problem — long-term exposure to unnatural or synthetic substances resulting in unintended effects. [54,67]

We are as children playing with life's building-blocks with little knowledge of its purpose, origin, constructs, and dangers. Genetics are so complex that humans will likely never fully understand their true nature, origin, and purpose for hundreds if not thousands of years. Yet, we, as a human species, feel inclined to artificially manipulate, exploit, and abuse life for corporate financial gain. Ultimately, genetics are the very sacred foundation for life itself and define the reality we experience today and the reality we will experience for future generations to come. Artificially engineering genes (before understanding the long-term consequences) and allowing them to proliferate is not just unwise, it is plainly reckless. It has the potential for extremely dangerous consequences that we as a human species will regret leaving for all future generations to endure. [35,54,67]

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