Genetically Modified Organisms

By Ashley Bowers

Genetically modified organisms (GMOs) are altered by artificial means through the reconstruction of their DNA. GMOs have gained popularity in the food industry because they possess desirable traits; certain GMO crops resist pesticides and yield a higher productivity of food as with the production of more dairy products to be produced from animals. However, the negative effects of both outweigh the positives, particularly in considering people's health today and tomorrow. Genetically modified organisms and hormonally modified livestock are currently not required to be labeled when sold in grocery stores. Thus, consumers may not know whether they are buying foods that have been genetically altered with chemicals and other such additives. These additives are now gaining negative publicity in that they are bad for one's health and body. Requiring the government to label genetically modified foods provides important information for the consumer; therefore, consumers benefit and America will join other countries in labeling GMOs.

American consumers are currently unaware which foods they buy in a grocery store are genetically modified. This obliviousness is brought on by the lobbyists for the Food and Drug Administration (FDA), and the companies who produce the genetically modified foods themselves. There is one company that is the world leader in agrochemistry and genetically modified organisms and that company is Monsanto. Marie-Monique Robin, who is an award-winning French journalist, states in her book *The World According to Monsanto*, that Monsanto was "founded in St. Louis, Missouri, in 1901, which now owns 90 percent of patents for all GMOs grown in the world and became the world's largest seed company in 2005" (Robin 2). Because of its dominance in the agri-business industry, Monsanto is a part of a lot of controversies regarding genetically modified organisms. The company makes toxic products as well as the herbicide Roundup, which, when it claimed it was "biodegradable" and "good for the

environment," later got the company in trouble for false advertising for making such claims (Robin).

Monsanto has questionable marketing schemes, as they strongly try to influence the general public that they are a company focused on the people's best's interests and that its products help farmers. Monsanto has crops all over the world with its genetically modified organisms and continues to claim that it is a company that has a focus on environmental sustainability and the good of humanity (Robin 4). Robin looked on Monsanto's website and wrote in her book that the company:

> presents itself as 'an agricultural company' whose purpose is to help farmers around the world produce healthier food, while also reducing agriculture's impact on our environment.' But what it did not say is that before getting involved in agriculture, it was one of the largest chemical companies of the twentieth century, specializing particularly in plastics, polystyrenes, and other synthetic fibers. (Robin 3)

Monsanto's website is specifically geared toward showing only positive points of the company, and it seems like a company that is actually doing a lot of good for the agricultural industry. This false advertising is misleading to onlookers and it is only this positive side of its company that Monsanto wants people to see and know about.

Further in her book, Robin states that during her long-term investigation of the company, she contacted someone who the St. Louis headquarters sent her to, "Yann Fichet, an agronomist who is the director of institutional and industrial affairs of the French subsidiary located in Lyon" (Robin). Fichet agreed to meet with Robin and sent her request to meet with the Missouri

headquarters. As Robin recalls, she waited three months to hear of a rejection about the interview. The rejection of the Missouri headquarters of Monsanto to interview with Robin could have signaled that they feared her asking a question that they would have to lie to provide an answer to. Based on the external sources of their website and advertising, it appears that Monsanto strives to produce a favorable appearance that will provide benefits for the future of humanity and agriculture.

As one investigates further into Monsanto, however, their questionable profit margin becomes increasingly apparent. According to the company's own website, in 2012 Monsanto's net sales were 13,504 million dollars ("Financial Highlights" Monsanto). Monsanto makes a lot of money and the company could potentially benefit even more so by using the money in more of a positive way. Monsanto could turn around their tactics and become a company that actually stays true to their word.

Once farm soil has been destroyed with the Roundup chemical Monsanto produces, it becomes dependent on it. Therefore, farmers whose crops have been infected with it cannot go back to regular farming. Monsanto traps consumers into its cycle, for the company's "actions are designed to maximize its corporate profits, not to serve the people. Its entire seed-and-herbicide business model is designed to trap farmers in a system of economic dependence... to turn farmers into indentured servants" (Adams). Making sure they patent everything they produce, "when Monsanto's GMO seeds blow into the fields of farmers who are trying to *avoid* growing GMOs, Monsanto uses its patent 'rights' to sue the farmers and claim they "stole" Monsanto property" (Adams).

Monsanto not only is a ringleader in producing these factory farms that hold genetically modified foods, but they are taking over independent farmer's farms at an increasing rate, causing the farmers and their families to lose a majority of what they have. In August 1998, a Canadian canola farmer named Percy Schmeiser was taken to court by Monsanto, in which Monsanto claimed "he illegally planted the firm's canola without paying a $37-per-hectare fee for the privilege" ("The Conflict"). However, unlike other farmers who Monsanto has taken to court, Schmeiser spoke out and fought back stating that "that company seed could easily have blown on to his soil from passing canola-laden trucks" ("The Conflict"). During the three week court hearing:

> Monsanto presented evidence from two dozen witnesses and samplers that Schmeiser's eight fields all were more than 90% Roundup Ready, indicating it was a commercial-grade crop. Monsanto performed no independent tests as their tests were all performed in house or by experts hired by the company. ("The Conflict")

Although Schmeiser received a few monetary donations here and there to help him pay the $400,000 Monsanto requested for patent infringement, court fees, profits they feel Schmeiser made on the crop, and more, the bottom line is that large companies such as Monsanto use their power to their advantage, victimizing small-town farmers along the way.

Not only does Monsanto create genetically modified foods through their genetically engineered seeds (Roundup seeds), they inject cows with bovine growth hormones. Bovine growth hormones, rBGH, are hormonally modified livestock that result when an animal is injected with artificial growth hormones. This is a way farmers try to yield a larger production of

products. An example of this is milk from cows. Genetically engineered hormone injections are not healthy, not only to the animal, but to the consumers of the animal's products as well. Bovine growth hormones were "discovered to create severe inflammation in the cow's udder called mastitis which leads to large amounts of infected pus in the milk" (Quigley 27). However, people realized this problem and to balance it out, they started feeding cows a larger-than-normal number of antibiotics, which is found in the drinking milk produced. Monsanto uses rBGH in their cows and when this was brought to the attention of one FDA worker, the worker was fired for challenging Monsanto's scientists' a second time for presenting improper data about the cows they injected (Robin 93). The FDA was on Monsanto's side, to "protect the company's interests" so therefore it "closed its eyes to the disturbing data" (Robin 93). All the while, the FDA worker, who shares his experience in Robin's book, recalled that "during the appeal, Monsanto's lawyers threatened to go after me if I revealed confidential information about rBGH" (Robin 93). Monsanto claims to have the people's best interests at heart, although, Monsanto does the same thing with crops as it does with cattle, by not revealing the negative side effects.

In stores across America, labels of whether certain foods are genetically modified or not are currently not required. Average consumers are potentially unaware of which foods are genetically modified or not. It is currently a national policy in America for organic foods to go through the United States Department of Agriculture's National Organic Program and the Organic Foods Production Act in order for certification to be sold in stores as organic foods. If the same type of act were to be applied to GMOs, the consumer would be able to make a decision on whether or not they wish to buy the products.

One of the current problems with genetically modified foods is that most people do not know the health risks, ecological risks, harms, and impacts that are associated with them. This

ignorance regarding genetically modified organisms of the general public translates into a problem of consumers not knowing what they are ingesting into their bodies. A comparison can be made between GMOs and the organochlorine insecticide chemical DDT, dichlorodiphenyltrichloroethane, that was used up until the mid-20th century and grew increasingly popular until 1962, when a book written by American aquatic biologist Rachel Carson, *Silent Spring*, was published. *Silent Spring* explained its dangers and brought to light the fact that it was being used in vast amounts with little knowledge of its effects on the environment and people. This is similar to today, where genetically modified organisms are currently mostly thought of as good to the general public, because common thought is that they help an increasing population due to their ability to yield mass amounts of food. However, what the public does not see, is the dangers and negative side of genetically modified organisms and why they should be labeled. In Rachel Carson's *Silent Spring*, she states:

> I contend, furthermore, that we have allowed these chemicals to be used with little or no advance investigation of their effect on soil, water, wildlife, and man himself. […] There is still very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. […] We urgently need an end to these false assurances, to the sugar coating of unpalatable facts. (Carson 13)

In current times, Monsanto is the largest seed company in the world, it is also the company that is providing these false assurances about GMOs to the public. Through the closed doors of the governmental agencies, GMOs effects on the environment go unnoticed.

Some of the ecological risks associated with genetically modified foods are the threat to genetic diversity of crops, small populations potentially becoming extinct, and the injection of new viral strains of recombinant DNA into genetically modified foods. The United States holds diversity for "berries, sunflower, Jerusalem artichoke, pecan, black walnut, and muscadine grape" (Rissler and Mellon 57). Variations in these species are declining rapidly, due to destruction of land and as crops are abandoned by farmers for various reasons. This allows for genetically modified crops to take over as they could potentially "confer tolerance to cold, heat, drought, or salt" better than the crops and plants originally grown in that area (Rissler and Melon 56). As for viral strains of recombinant DNA being injected in the genetically modified organisms in attempt to ward off viruses arising in the plants, new viruses may emerge anyway. Study of the ecological impact of this recombination of GMOs is still new; however, "some scientists speculate whether that recombination may play a role in the evolution and survival of plant viruses or, under certain conditions, produce a new viral strain with an altered host range" (Rissler and Mellon 62). As the importance of GMOs increases, the public knowledge of GMOs should become more of a priority.

Other countries speculate that certain diseases present in society are the cause of genetically modified organisms. In the 1990s, as Mad Cow Disease, or Bovine spongiform encephalopathy (BSE), began its spread through Europe, "Germany's Green Party began attacking what it called 'genetically modified organisms' or 'GMOs'" as a possible cause (Pence 9). Greenpeace International argued consistently throughout the late 1990s that "although no evidence exists of dangers to digestion or environment from GMOs, it's better to wait and see before allowing their growth" (Pence 9). This "better-safe-than-sorry" attitude is a cautious one towards GMOs and represents how Europe interprets the situation. As the amount of information

on GMOs and their negative effects on not only the environment but humans as well is becoming increasingly available, America should recognize these effects and take them into consideration when debating policies on the labeling of genetically modified foods in the lawmaking realm of the country.

As lawmakers are influenced by company spokespersons from the agri-business industry, lawmakers do not question when they are told that "GE food is identical to foods bred by selective (traditional) breeding; GE food is safe; GE food is associated with good environmental practices; and GE food will cure world hunger" (Nelson 217). The truth to these claims, however, lies in the science behind the statements. "Scientists note that conventional breeders rely on processes that occur in nature (such as sexual and asexual reproduction) to develop new plants" meaning that in conventional breeding of food, the process is often safer than the genetically engineered process of reproducing food. This is because with genetic engineering, the combination of genes is often unpredictable and therefore presents possible risks (Nelson 218). "In 1997, when farmers growing GE cotton reported that the plants had stunted growth, deformed root systems and produced malformed cotton balls" and the ability of genetic engineering to allow scientists to "transfer genes from completely unrelated life forms, creating such concoctions as corn that exudes toxins found in soil bacteria or tobacco that glows due to the insertion into its genome of a firefly gene," explains this phenomena. Since the outcomes of genetic engineering and/or modification are so unpredictable, the waiting and seeing of results of the finished product is necessary in order for the safety of GMOs to be tested and accounted for in lawmaking. The impatience of the lawmakers combined with the lack of willingness to change policies that do not concern their best interests and relations with companies, is something that influences their decisions on whether GMOs should be required to be labeled or not.

The result of genetic modification is something that is hard to predict given that organisms are produced by the combination of different genes chosen by the scientists that create them. This is in itself knowledge that is gained in the scientific methodical process by examining the results of the production/experiment. It is therefore necessary to take precautions when dealing with GMOs given the uncertainty of the outcomes of their genetic combinations. Because the outcomes are unpredictable and cannot always be known in advanced, the precautionary principle needs to be adhered to.

Once the outcomes are known, this knowledge of GMOs, once gained, is rarely translated out of the scientific community and into the general public because "many regulatory systems use outside scientific advice experts on advisory committees to help assess a GM application. However, they only provide advice and do not make regulatory decisions themselves, as they are not accountable to the public" (Thomson 115). Although "these authorities should have a prime responsibility to protect public health and the environment" there is often more to the situations than that. There are possibilities of the agri-business industry sending out lobbyists to try and sway lawmakers to vote in their favor on propositions regarding genetically modified foods and money could potentially be involved in the deal as well, complicating the issue further. There needs to be justice within our judicial system as people are not provided with the labels of GMOs while shopping in stores. Therefore, they are not given that initial knowledge that should be provided prior to purchase and consumption of GMOs, given the associated problems and potential health risks of them.

It is not only in the best interest of the citizens of America for genetically modified organisms to be required to be labeled, but it is in the best interest of the nation as a whole. The knowledge of the effects that GMOs have on the environment as well as animal and human health lie in the results of the experiments that genetic engineers perform to create GMOs. From analyzing these results, there seems to be a negative conception associated with genetically modified foods spanning from the scale of agri-business to the individual. Putting this scale into terms of the person, as Rachel Carson quoted experimental biologist Jean Rostand in Silent Spring, "'the obligation to endure gives us the right to know'" (13).

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