Hadyn Harrell

English Composition II

Dr. Ronald Partridge

28 March 2018

Genetically Modified Organisms and Its Effects on Agriculture

In the United States of America, most of the crops that farmers will plant, spray, pick, and sell have some kind of genetically modified DNA (Beck). Eighty-eight percent of feed corn, ninety-four percent of soybeans, and ninety percent of cotton is considered a genetically modified organism. In 1996, only six countries were producing and consuming these genetically modified organisms, GMO (“Genetically Modified Crops”). Then in 2009, almost forty developing country were making and using the crops, and the farmers were working 139 million hectares of land with these GMOs (“Genetically Modified Crops”). These plants will look, taste, and can be used just like the untouched crop, but with the genes changed in the DNA, the roots will be protected from weeds and pests (“Benefits of GMOs and Biotechnologies”). While the mixing of species to give a plant a desired trait makes genetically modified organisms a good choice for farmers (“Benefits of GMOs and Biotechnologies”) some consumers activist, and even politicians are showing concern for the number of GMO crops being harvested and sold (“Q&A: Genetically Modified Food”).

Genetically modified organisms are plants, animals, or microorganisms that have been altered genetically to a state that it does not appear naturally by mating or recombination of the species (“Q&A: Genetically Modified Food”). The process for creating these GMOs is the trait being found in nature, a gene for the trait being transferred to a new plant, the new plant is tested to make sure it is safe, and finally the seeds for said plant are approved and sold to farmers (“Benefits of GMOs and Biotechnologies”). This scientific process is also called “modern biotechnology”, “gene technology”, “recombinant technology”, and even “genetic engineering” (“Q&A: Genetically Modified Food”). GMO is good for use in two main ways, pesticide and herbicides (Harrell). It gives the plants an upper hand against weed killers and bugs attempting to eat and destroy the crop (Harrell). An example of this technology being used is genetically modified corn containing genes holding pesticides to kill larval pests (“Genetically Modified Crops”). This corn is being used in many common foods including cornmeal, tortilla chips, and high-fructose corn syrup which is a sweetener in soft drinks and other goods (“Genetically Modified Crops”). The first idea of recombinant DNA was first made in 1973 by a graduate student from Stanford University Medical School, then in 1975 doctors and biologists got together and made guidelines regarding the guidelines for producing and selling these GMO goods (Woolsey). In 1980 the first GMO patent was passed in a five-to-four supreme court ruling between genetic engineers and the US Patent Office (Woolsey). Then two years later the FDA approves the first GMO product, and in 1994 GMO hits the grocery store with “Flavr Savr Tomatoes” which delayed ripened the tomatoes to keep it on the shelf longer (Woolsey). Genetically Modified Organisms are a technology beyond our time, and it has come a long way since the 1970’s.

Agriculture is one of the main industries affected by the usage of genetically modified organisms because scientist working with seed companies alter the make and make the seed resistant to round-up, or weed killers, that would normally affect the heath (Harrell). Local cotton, corn, and peanut farmer, Walton Harrell believes GMO crops are beneficial to the farm industry because it lessens the amount of spraying involved in the process, increases crop yield, and all this equals out to an increased profit. Farmers spray crops to kill weeds or kill off insects trying to eat their crops, for example one bite from a boil weevil can kill an entire stalk of cotton, or pigweeds infesting peanuts making the picking difficult (Harrell). Crop yield also increases with the use of GMO seed for the reasons of less bugs and chemicals to kill the plant (“Benefits of GM Food”). This means there is more products per acre planted, and this makes the acreage more beneficial to the farmer (“Benefits of GM Food”). The usage of GMOs is good for the environment because more moisture in the soil which results in less till work (“Benefits of GMOs and Biotechnologies”). This will lessen the use of farm equipment in the field, which ultimately means less fuel is used and less greenhouse gasses polluted to the air (“Benefits of GMOs and Biotechnologies”). With these two factors in mind, the farmer is also increasing profit by not having to purchase as much chemicals to spray on the fields, not running as much machinery, and more product per stalk (Harrell). GMO has no doubt helped farmers in the ways of herbicide and pesticide (“Benefits of GM Food”), less machine work (“Benefits of GMOs and Biotechnologies”), and increased profits (Harrell).

GMO is beneficial to farmers, there is still some speculation on whether GMO is helpful or hurtful because genetically modified crops are a newer creation, and we haven’t seen the side effects to humans consuming it yet (Grant). There is also a downside to the herbicide and pesticide (Grant). When using GMO, the perks will flourish during the first couple years of its usage, while steadily going downhill within a few years due to the stronger insects and weeds becoming immune to the chemicals in modified plants (Grant). In 2011, a scientific study shows that out of thirteen insects, five were immune to genetic modifications (Grant). This means farmer will have to use more chemicals, therefor spending more money trying to fight off pests which was supposed to be prevented with the usage of GM seed (Grant). Genetic modified organisms will cause the usage of herbicide chemicals increase twenty-five percent in the next five years (Grant). It also takes legal business into view, having the use of second hand seeds illegal to use (Grant). Planting a crop, harvesting it, and gathering the seeds for next year’s season is enough for a seed company to sue someone (Grant). A seventy-four-year-old Canadian, canola farmer, Percy Schmeiser, was sued by seed company, Monsanto when it was discovered he had crops growing in his field that was linked with the Monsanto Roundup-Ready gene that was not purchased (Grant). “The court sides with Monsanto saying Schmieser “knew or ought to have known” his seeds were resistant to Roundup” (Grant). GM companies have pushed saying this will help a world food shortage, but it will not help a shortage when some countries will not eat the food with chemicals in it (Grant). There are alternatives however which include the following: greenhouses atop of grocery stores, hydroponics, and decentralization of farming (Grant).

The growing world of genetically modified organisms changing traits in crops has changed the farming industry for the better while some other people still have their doubts on whether it is at all helpful to the world (Woolsey). Genetically modified crops have not been around for a long time but has definitely made great technological advances in the time being (Woolsey). It has made farming easier, less harmful to the environment, and has even increased the profits off the crops (Harrell). People still have their doubts on whether or not GMOs are actually helping the farmer or hurting them by making them over time spend more unnecessary money (Grant). In all genetically modified organisms are great ways to help farmers, short term or long term, and there has not been factual proof to say it really hurts the average farmer.

Works Cited

Beck, Robyn. “Genetically Engineered Foods Q & A.” *USA Today*, Gannett Satellite Information Network, 28 Oct. 2012, amp.usatoday.com/amp/1658225.

“Benefits of GM Food.” *GMO - Benefits*, classes.soe.ucsc.edu/cmpe080e/Spring05/projects/gmo/benefits.htm.

“Benefits of GMOs and Biotechnology.” *Monsanto*, monsanto.com/innovations/biotech-gmos/.

“Genetically Modified Crops.” *Federation of American Scientist*, fas.org/biosecurity/education/dualuse-agriculture/2.-agricultural-biotechnology/genetically-engineered-crops.html.

Grant, S. “10 Problems Genetically Modified Foods Are Already Causing.” *Listverse*, 21 June 2014, listverse.com/2013/06/22/10-problems-genetically-modified-foods-are-already-causing/.

Harrell, Walton. “GMO Interview with Farmer.” 26 Mar. 2018.

“Q&A: Genetically Modified Food.” *World Health Organization*, World Health Organization, 2014, www.who.int/foodsafety/areas\_work/food-technology/faq-genetically-modified-food/en/.

Woolsey, GL. “GMO Timeline: A History of Genetically Modified Foods.” *GMO Inside*, Rosebud, 13 Sept. 2012, www.gmoinside.org/gmo-timeline-a-history-genetically-modified-foods/.