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Science, Agriculture



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October 2012 Evolution of Genetically Modified Crops The evolution of

Genetically Modified crops (GM) has, for the first time in history, presented us with a solution to the problem of global hunger. The world's population has almost reached 7 billion people and is growing exponentially. This raises the question: how can we supply food to so many people nutritiously and affordably while protecting and preserving the environment? Genetically Modified (GM) crops are created for human or animal consumption using the latest molecular biology techniques. These plants are modified in the laboratory to enhance desired traits such as increased resistance to pests and diseases, improved nutritional content and also faster rate of growth (Hayes, Genetically Modifies Foods). The genetically modified crops tend to overcome these problems in a number of ways for example increased yields of crops, less use of pesticides and herbicides leading to the minimization of cost. The advancement of GM crops has now made it possible to increase the crop yields for comparatively less acreage than organic agriculture. The emergence of GM crops over the last decade has allowed man to make better use of the land available, thus the remarkable rate at which crops are produced should not come as a surprise. This is evident from the fact that the annual total output has increased considerably since the introduction and evolution of GM crops and its technology. The United States Department of Agriculture recently published statistics that show a substantial increase in total grain production since 2005(Hayes, Genetically Modified Foods).

Therefore, we can say GM crops are contributing towards the eradication of the global hunger. The latest GM crops are engineered to have substantial

resistance against various insects and pests and so require little or no use of pesticides and herbicides. Thus they reduce the use of synthetic chemicals that are known to be harmful not only to the crops and the human body, but to the environment as well. "Over the last fifty years many human illnesses and deaths have occurred as a result of exposure to pesticides, with up to 20, 000 deaths reported annually" (Deboroh, Genetically Modified Foods: Harmful or Helpful?). Hence, the production of genetically modified crops aids in reducing the health risks associated with the consumption of organic foods that contain harmful chemicals, as well as benefits the land and allows limited world resources to be put to their most efficient use. Thus, farmers have been using large quantities of chemical pesticides and insecticides for the purpose of protecting their crops, which has proven to be quite costly, however with the evolution of GM crops the use of such chemicals has been minimized resulting in lower costs (Coble, " American Journal Of Agricultural Economics"). This has enabled farmers to save money and reinvest in GM crops that perhaps, will eventually lead to the eradication of world hunger. GM production and technology can potentially help curb ever rising food prices for several reasons such as cost of production and mass production. The cost of production for GM crops is marginally lesser than traditional organic growing methods because they require fewer chemicals and are produced under incredibly large economies of scale hence reducing the average cost per unit. As a result, staple foods such as soya bean, rice, wheat, maize and potatoes can be mass produced easily and conveniently which increases the supply of these food products in the market and enables the population to take advantage of lower prices Thus,

there is a larger quantity of food at lower prices available to those who previously could not afford the crop. In 2010 the Food and Agriculture Organization published that almost 925 million people were undernourished and were unable to meet the minimum calorie intake per day (Deborah, Genetically Modified Foods: Harmful or Helpful?). However, with the evolution of GM crops and the emergence of large organizations such as Monsanto, the statistics have changed drastically and more people are meeting the daily calorie intake requirements (Coble, "American Journal of Agricultural Economics"). These exponential enhancements in genetic engineering has now made it possible to grow crops in climates and land previously unsuitable for cultivation thus allowing crops to be grown in almost every season. With increasing populations in most third-world countries, there exists an opportunity cost for allocating land to GM agriculture; that is the allocation of this land to the various housing, development, municipal and medical scheme potential it possesses. Critically speaking, however GM crops are allowing us to make better use of the limited land left for agricultural purposes, especially considering the magnanimously larger yield of crops it offers per acre of sown land. However, many countries in Europe and Asia seem skeptical about the issue of GM crops. They dismiss its use on the basis that GM crops have not been around long enough for the effects to be manifested and no one can be certain of the potential risks of the consumption of crops that have been tampered with. Furthermore, environmental organizations such as Greenpeace and Friends of the Earth raise concerns about the effect that GM crops have on the soil. Greenpeace says that GM crops release many unwanted chemicals into the soil as a

considerable number of farmers that grow GM crops in America have reported deterioration in the soil quality. Greenpeace also argues that large sums of money are spent on research of GM crops that are surrounded by uncertainty. Furthermore, the seeds are at least twice as expensive as normal seeds and possess a small life span of 12 months. This means seeds need to be bought yearly which in turn means higher profits for organizations like Monsanto that have net sales figures shouldering the GDP of some third world countries such as Bhutan (Greenpeace-" Environmental impacts of GM crops." ) . On the other hand, when we talk about the deteriorating quality of soil, it could be due to the improper use of GM crops production methods. The farmers are not trained enough to use the new technology with the expertise which it requires (Brander, " Detection of Genetically Modified Food"). Moreover, those who argue that large amounts of money are spent on research, often overlook the fact that the return on investment is really high and is benefitting the world in many ways. Also, the expensive seeds are compensated by the higher revenues earned due to a larger yield and a more rapid rate of growth. Lastly, even though organizations such as Monsanto earn net revenues larger than that of some third world countries, it is because of them that these third world countries are and will have a large variety of cheaper and more beneficial durable foods in the future. Although the criticisms about the GM crops might have some weight but the benefits of this technology towards the eradication of global hunger out numbers all the negatives associated. In conclusion, the evolution of GM crops over the past few years has seemed to solve the problem of world food shortage to a considerable extent. Not only has it

allowed food output to increase, but the persistent advancement in its production technology has allowed for many foods to be transported over borders and seas making different varieties of healthy foods readily available all over the world. Previously, many third world countries could not make use of their uncultivable land and unsuitable climate but with the evolution of GM crops they are putting these natural resources to better use. Even though the use of GM crops is undoubtedly associated with some drawbacks, the advantages outweigh the risks quite substantially in terms of the benefits they bring to health, yield and durability. Thus, GM crops and their evolution has proved to be a milestone in the process of solving world food shortages and has had many positive spillover effects such as minimization of costs and increased nutritional content in foods. Works cited page. Brander, Diana. "Detection of Genetically Modified Food." N. p., 2002. Web. . Coble, Keith H. "American Journal Of Agricultural Economics." N. p., May 2005. Web. . Deborah. "Genetically Modified Foods: Harmful or Helpful?" Genetically Modified Foods: Harmful or Helpful? N. p., 2000. Web. 15 Oct. 2012. "Environmental impacts of GM crops." Greenpeace Australia Pacific. 15 Oct. 2012 . Giménez, Eric Holt. "The world food crisis." World Hunger. 15 Oct. 2012 . Hayes, Dermot J. "Genetically Modified Crops." American Journal of Agricultural Economics (2005): 931-50. Jstor. org. Web. .