

HOPES AND DECEPTION IN TRANSGENIC AGRICULTURE

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Abstract

It points out the need to change the mentality of the technologies used in agriculture, default chemicalization, use of pesticides and animal growth biostimulatorilor and beyond. These have to be tempered first under biological laws, and after that under economic criteria and not vice versa as it has been done before. The technologies used to increase productivity in agriculture have evolved continuously, and if at first the effects were considered beneficial for mankind, then we found that things are not quite so. The same thing happened with genetically modified organisms (GMOs), which were "experienced" with great expectations. In the developed material, the authors present some information on the evolution, criticism and failure of GMOs. Today, based on overwhelming evidence, there is a growing opposition to GM products, despite the offensive of some production corporations. More intensive work is needed from the environmental organizations and forums, in order for the governments officials to be able to make decisions, to act in the interest of a healthy diet of humans and animals.

Key words: GMO, transgenic agriculture, ecological balance

INTRODUCTION

In a world where population is growing more and more, agriculture will have to provide not only quantitative but also quality of human nutrition. The effects of environmental degradation inevitably leads to lower productivity in agriculture, with a huge risk for loss of Earth's food security, given that we are witnessing major threat of climate change.

Far been shown to the use of chemical fertilizers, pesticides and irrigation to produce food to meet quantitative global population. Also these measures reduced soil fertility [3,4]. Moreover, by chemicalization agriculture were introduced factors of decomposition, and disintegration that had hostile effect over life at all levels. The use of pesticides causes extremely high damage from acute poisoning, fatal or not, to chronic poisoning with fatal carcinogenic or mutagenic effects. Due to climate change, irrigation will not be able to ensure a degree of crop protection, and environmental impact of air pollution is seriously affecting food security of the planet.

To find acceptable solutions, we must take into account the biological laws that govern all structural levels of the biosphere and the complex interactions between specific processes and phenomena in biology.

It requires a change of mentality in order for technologies, default chemicalization, use of pesticides and animal growth biostimulatorilor can be subordinated first to biological laws and not only in economic criteria, as has been done so far [4].

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MATERIAL AND METHOD

The paper is based on information drawn from multiple bibliographic sources of the development of transgenic and GMO agriculture in general. The paper presents information on the progress and hopes, the

use of GMOs, GMO criticism and failure and a perspective on the situation in Romania regarding the issues mentioned.

RESULTS AND DISCUSSION

1. Evolution of genetically modified organisms (GMO)

Since 1973, research in cell biology have opened new horizons for applications of genetic engineering in the agriculture and medicine. In 1978, Herbert Boyer was able to obtain through genetic modification, of human insulin from *Escherichia coli*. There was growth hormone in yeast or genetically modified bacteria, bioreactors, vaccines from genetically modified organisms, etc..

Genetic modifications have become of concern to scientists, but also a huge economic and political stakes.

In 2001, the United Nations claimed that the best tool to eradicate hunger in the Third World is developing transgenic crops [12]. Scientific concerns, but especially large corporations have huge economic interests: Astra Zeneca, Novartis and Monsanto, that the transgenic agriculture provides 70% of GM seed market, growth hormones and pesticides.

In 2003 the area for GM crops worldwide was 68 million hectares, while in 2006 to reach 102 million hectares and 7% of the total land area. In this area, more than 50% are in the U.S., 18% in Argentina, 12% in Brazil, 7% in Canada and 4% each in China and India [9].

Of world production of soybeans, 55% is genetically modified. Between 66 and 75% of U.S. food contains ingredients from soy, corn and genetically modified sugar. The conference in Sweden in 2001, the United Nations Food and Agriculture Organization (FAO), summarize the present GMO agriculture pests and virus resistance, herbicide tolerance, slow ripening process and thus ensures a greater durability of the products on the shelves [9]. In support of genetically modified crops, American Institute of Biological Sciences (2002) argued that these can avoid epidemics, their crosses could be produced controlled, with

lower production costs in the long term and require fewer herbicides.

To advertise in support of GMOs also shows that: rice with vitamin A incorporated can prevent blindness of the 100 million children with vitamin A deficiency, genetically modified soy crops have a lower content of trans acids and monounsaturated fats, genetically modified tomatoes were helping preventinon of cancer and osteoporosis. In addition ripening process is slowed down and have a longer life on the shelf, as well as bananas, genetically modified potatoes absorb less fat during roasting, frost-resistant genetically modified strawberries, genetically modified apple incorporating a vaccine against childhood pneumonia, genetically modified animals grow faster and need less food (genetically modified salmon could grow 30 times faster than normal, etc.).

In contrast to those stated above, some sources [2] refers to the risks of GM crops: gene transfer by pollen from genetically modified crops to grasses that become resistant to pesticides, occurrence of diseases and pathogens, affecting other plants in ecosphere, destruction of bio-communities and agro-ecosystems, irreparable destruction of species diversity and genetic variability, animals and human health risks through the appearance of allergies and new toxins, increasing resistance to antibiotics, etc..

Currently, benefits and risks of GMOs should be evaluated not only quantitatively, qualitatively and economically, because the adverse effects of transgenic agriculture practice may prove irreversible [9].

In defending their interests, corporations producing GMOs support the coexistence of GM and natural ones, but in reality it is not possible. Contamination by wind affects all the flowers, insects, birds and other animals. Transferring genes for resistance to herbicides and insecticides may lead to new species of pests and epidemics. Destruction of species of butterflies and birds compromise the food chain. If in 1998, GM maize was cultivated in Spain on 16 000 ha and 12 000 ha in France today after cross pollination, the MG territory can not be

defined anymore. In England, the GM beet is threatening the survival larks (*Alauda arvensis*). The monarch butterfly species (*Danaus plexippus*) was decimated at a rate of 44% of GM maize.

Bees in the U.S., that pollinate about 35% of U.S. crops were destroyed at a rate of 30% of pesticides or pollen Bayer Crop Terminator [11]. Terminator technology is the introduction of suicide genes in plants that the farmer can no longer be autonomous on his own seed, but to depend on the company producing (Monsanto) for each season for seeds and herbicides needed. Copatentor of the technology is the U.S. Department of Agriculture.

2. Criticism of the GMO programs

Even if GM crops resembles physical and organoleptical with the natural ones, the analysis have not been on food security, even with the warnings from scientists that the effects of genetic changes are not immediately visible, but long time [5]. Producers and users of GMOs argue that studies revealed no significant differences, but at present there is sufficient evidence to trigger an alarm. In experiments on guinea pigs by Monsanto company with GM 863 maize, some aspects were revealed: reduced kidney, liver damage, increased white blood cells and other indicators of toxicity. After the EU Environment Council pointed the Corporation to publish the results, the EU has banned the importation and use of this type of corn on European soil.

In rabbits fed with GM soy, secretion was abnormal in liver enzymes [10]. Consumption of GM potatoes by rats led to partial atrophy of the liver and an abnormal inactivation of intestinal cells [7]. GMO-fed animals show regular changes in the organs (liver, kidney) and blood triglyceride levels were higher by 24-40% [13]. Offspring rats fed GM Liberty Link corn had a mortality twice that of those feed with organic foods.

Mice fed with GM soya and Roundup Ready potato, had an increased pancreas and profound changes. GM potatoes caused slower growth of the brain. Offspring derived from females fed with GMO died at a rate of

52% in first 3 weeks compared with only 9% of chickens in the control group [1].

"Mad cow disease" has its origins in food with cheap protein derived from ruminants bodies, supplemented with a bovine growth hormone rBGH, which is approved by the Food and Drug Administration in the U.S.. This hormone affects not only the animal brain but also its milk. Samuel Epstein of the University of Illinois, USA, show that cows fed rBGH milk differs from natural milk in terms of nutritional, biochemical, pharmacological and immunological contaminated with antibiotics used to treat mastitis. U.S. forums and bodies have unnoticed the danger while Canada and Europe have banned the sale of modified milk [8].

A bad influence on bees and other insects, birds and the soil were cotton and corn - crops "improved" genetically with *Bacillus thuringiensis*, used against polenivore insects cultivated in areas of Thailand.

Genetically modified organisms used in food have adverse effects on health of consumers. In order to increase profits of a nutritional supplement "tryptophan" Japanese company Showa Denko has introduced a bacterial gene fragment in the original product, making GM Tryptophan. As a result of this intervention was the emergence of a syndrome called eosinophilia hyalgia that caused 37 people dead, paralyzed and 1535 thousands of people affected by blood disorders for which sued the company has been ordered to pay compensation of two billion dollars.

The Center for Disease Control and Prevention in the USA hired two institutions responsible for research to clarify the alleged link between Mogellons and genetically modified organisms (GMOs). This syndrome has been identified in America, Europe, South Africa, Japan, Philippines, Indonesia, Australia etc.. Those affected by illness accuse them unbearable itching skin and the appearance under the epiderma of red fibers, blue or black to grow out and pierce the skin. There is also fatigue, mental confusion and memory loss and other dysfunction, leading

to the loss of work capacity and the very serious problems [9].

Research conducted on fibers collected from patients with Mogellons showed that the nature of the fibers was natural cellulose, cellulose that can not be synthesized in the human body. Further investigations have identified that the DNA fibers of mushrooms, and then *Agrobacterium* gene used for genetic modification of crops.

3. The failure of genetically modified organisms

After only seven years since the UN promote the development of transgenic crops to solve hunger in third world, same UN organization called the Johannesburg scientists from 60 countries to adapt farming development plan for the next decade. In its report "International Declaration of Agricultural Science and Technology for Development (IAASTD) published in April 2008, indicated that the effect of transgenic agriculture is unsatisfactory and that GMOs are not a panacea for eradicating poverty, hunger or climate change.

In July 2008, another report, signed by a group of scientists, shows that there is no evidence that GM plants have an increased tolerance to drought or to reduce the use of artificial nitrogen fertilizers and pesticides. Our food lost vitamins, taste and variety and become unhealthy [6].

Many farms show that organic farming is the solution for ensuring world food in a time of rising oil prices and increasing pollution and not the GM crops (IAASTD, International Trade Center, World Trade Center Advisors and the UN).

As a consequence, there is today a public opposition to GM products. Globally more than 100 major agricultural regions were defined by OMG and 40 other countries, amounting to 1 / 3 of the world, called labeling the GM products. In 2007, Kofi Annan, UN Secretary General then took position against the use of GMOs in the fight to eradicate hunger in Africa (Business Daily - Kenya, July 17, 2007).

The combat of GMOs producing companies offensive is not an easy task. Financial and political interests are huge. For

example, the company Monsanto is similar to an octopus served by thousands of agents who are spying how agriculture is conducted, is interested in seizing the entire food chain in the world, the company indicating its influence on the authorities responsible for legislation. The terminator seed technology seeks to make the food markets in India, China, Pakistan and the major producing countries. With financial support from the Rockefeller corporation, Monsanto spent over 100 million dollars to subsidize research and development of GM crops in the world and even the U.S. election campaigns.

By funding the training of researchers in the Philippines, Thailand, Kenya, China, the company has created Monsanto bridgeheads everywhere. The rest settled by time and wind pollination of conventional crops with genetically modified pollen.

The stakes are very high because of U.S. global domination is based not only on military control and energy but also food stock of the planet.

4. Views on the situation in Romania

When referring to agricultural production, Romania is among the 22 countries growing GMOs. At the EU Agriculture Ministers Council meeting (22-23 October 2007), Romania voted in favor of placing on the EU market of three new types of genetically modified. Since January 1, 2007, in line with European legislation, the cultivation of GM soya in Romania is banned but not the imports of GM soya which is used heavily in feed.

When referring to food, which for more than 70% is imported, most of them are based on GMOs, which means that most of the population is consuming GMO. Moreover, it is unlikely that feed additives used in animal feed not to rely also increasingly on GMOs, and consumers "benefit" of animal products consumed and not only.

Why Romanian agriculture has reached an impasse? It is likely to have large circles of interests for food imports to the detriment of developing a sustainable local agriculture and healthy.

In contrast to the show, Ministry of Environment, supported by several NGOs, including Green Peace, is against GMOs, but unfortunately with how much influence? It is our duty to draw attention to this state of affairs, and governments make decisions to act in the interest of a healthy diet of humans and animals. Work is needed more intensive environmental organizations and forums, all non-governmental organizations for the world to be informed about the risks of GMOs, and additives harmful to, for that witticism "escape who knows" is more topical than ever.

CONCLUSIONS

1. Globally there is a dispute of opinions for and against the use of genetically modified organisms.

2. The corporations producing the transgenic agricultural support benefits to solve the alimentary problem for Earth's continuously growing population.

3. Important scientific fora but also the facts have shown the negative impact of GMOs on the health of humans and animals.

4. Transgenic agricultural technology influences negatively the trophic chain of the planet by destroying bio-communities and agro-ecosystems, species diversity and genetic variability.

5. There is a huge offensive of the GMO producing companies in order to seize control of the food on the planet, without taking into account the negative effects of GM products.

6. Romania's agri-food policy is not appropriate for the healthy diet of animals and people, being necessary to involve legislative and governmental fora to remedy this inconvenience as soon as possible.

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