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THE BASIC CONTRADICTION AS FOR CULTIVATION AND USE OF GMOs

The article examines trends in the development of biotechnology at the global level. The position of Ukraine on cultivation and use of genetically modified organisms is studied. The prospects of genetically modified organisms' introduction and potential risks associated with their cultivation and use.

Keywords: *biotechnological production, genetically modified organisms, strategic opportunities, potential risks, safety, health of the nation.*

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ОСНОВНІ ПРОТИРІЧЧА ЩОДО ВИРОЩУВАННЯ ТА ВИКОРИСТАННЯ ГЕНЕТИЧНО-МОДИФІКОВАНИХ ОРГАНІЗМІВ

У статті розглянуто тенденції розвитку біотехнологій на глобальному рівні. Вивчено позицію України, щодо вирощування та використання генетично-модифікованих організмів. Досліджено перспективи запровадження генетично-модифікованих організмів та потенційні ризики пов'язані із їх вирощуванням та використанням.

Ключові слова: *біотехнологічне виробництво, генетично-модифіковані організми, стратегічні можливості, потенційні ризики, безпечність, здоров'я нації.*

Рис. 3. Літ. 13.

И. Н. Лесик

ОСНОВНЫЕ ПРОТИВОРЕЧИЯ ОТНОСИТЕЛЬНО ВЫРАЩИВАНИЯ И ИСПОЛЬЗОВАНИЯ ГЕНЕТИЧЕСКИ МОДИФИЦИРОВАННЫХ ОРГАНИЗМОВ

В статье рассмотрены тенденции развития биотехнологий на глобальном уровне. Изучено позицию Украины относительно выращивания и использования генетически модифицированных организмов. Исследованы перспективы внедрения генетически модифицированных организмов и потенциальные риски, связанные с их выращиванием и использованием.

Ключевые слова: *биотехнологическое производство, генетически модифицированные организмы, стратегические возможности, потенциальные риски, безопасность, здоровье нации.*

Problem setting. At the global level, increasing of production capacity is discussed as a significant increase in the number of countries involved in biotechnological production. Evaluation of production shows that there is a typical commitment to biotechnology which is proved by the continuing size growth of the area which is designated for the genetically modified crops. GMOs produced through genetic technologies have become a part of everyday life, entering into society through agriculture, research, and environmental management. However, while GMOs have benefited human society in many ways, some disadvantages exist; therefore, the production of GMOs remains a highly controversial topic in many parts of the world.

Recent research and publications analysis. Many domestic and foreign scholars, including G. Brookes and P. Barfoot (2006), I. Grigorieva (2015), C. James (2014), S. Knapton (2015), S. Malyuta (2007), and many others study the possibilities of biotechnology as a strategic element of productivity increasing, improving food security and competitiveness in the international market. On the other hand a lot of experts consider that GMOs may be associated with a potential risk to humans and the environment. Among the authors of this scientific direction there are M.A. Altieri and R. Rosset (1999), M. Khor (2006), E. Surovtseva (2013). The significant differences of opinion require further study of issues related to the formation of international economic relations in the conditions of globalization.

The research objective is to study international economic relations in the context of globalization, determining their place depending on the stage of economic development, the formation of export-import potential.

Key research findings. The continuous growth of the size of the area which is designated for genetically modified crops at a steady growth rate of 3 to 4% or 6.3 million hectares per year shows that there is a place for the global commitment to biotechnology globally. Biotech crops were grown commercially in all six continents of the world. Of the 28 countries planting biotech crops in 2014, 19 countries planted 50,000 hectares or more to biotech crops (C. James, 2014).

According to the opinions of the European experts there is a probable decision

to grow biotech crops by the countries that are under development, and countries that have limited resources. As a consequence of that, the number of countries producing biotech crops could be doubled, increasing the crops' number.

In some countries and in Ukraine, in particular, there is no single view on genetically-modified crops.

Comparing the occurrence of GMO products, the use of biotechnology derived products and the application of one of the main methods of breeding (artificial mutagenesis) can be found in the scientific works of (Malyuta, 2007).

According to the Law of Ukraine "On ecological expertise" (The Law of Ukraine from 09.02.1995 # 45/95- VR) there is the approved list of activities and objects, classified as highly hazardous genetically-engineering activities, placing on the genetically modified organisms.

The regulation of such activity is carried out within the Law of Ukraine "On the State Biosafety System for creating, testing, transportation and use of genetically modified organisms" (The Law of Ukraine from 31.05.2007 # 1103-V). It provides the registration of genetically modified organisms and some restrictions on their use. But today the State Register contains no genetically modified crops. This means that in Ukraine genetically modified organisms are prohibited.

Considering the above mentioned it is appropriate to clarify the presence in the domestic market of biotech crops and genetically modified foods.

The statutory banning of GMOs' cultivation in Ukraine, as well as their use in the food industry, is quite a formality. That is why the threat of large-scale cultivation of GM crops in Ukraine and their use is very real.

Obviously, the lack of effective surveillance programs on margins and control of seed encourages farmers using GM crops. According to molecular genetic laboratory Ukrmetrteststandart there is about 30% of food products contain GMOs in Ukraine ("Ukrainian Truth. Life" from 19.02. 2009).

Modern biotechnology offers significant promise to mankind and bring with them both advantages and possible unknown risks and threats.

The main argument of GM crops' growing supporters in Ukraine is that the use

of GM technology would bring to manufacturers, the annual increase in profits. And the introduction of biotechnology would reduce the amount of herbicide application for processing plants, thereby reducing the burden on natural resources. In the cultivation of GMO crops supporters see prospects for rapid development of industry in Ukraine.

On the one hand genetic engineering is the powerful progress tool, but on the other hand with inadvertent using, it can meet a lot of negative consequences (Grigorieva, 2015).

British scientists are firmly behind genetic modification believing that it could help farmers produce plants which are healthier and need fewer pesticides. However a poll by YouGov last year found that 40 per cent of people believe that the government should not be promoting the adoption of GM, while just 22 per cent believed that they should. Many scientists believe the benefits outweigh the risks. Farmers have been changing the genetic make up of plants through breeding since agriculture began to improve yields and make larger and hardier specimens (Knapton, 2015).

The ability to grow more biotech crops on less acreage also aids farmers in being good stewards of the land. The reduction in plowing made possible through biotechnology enables farmers to significantly reduce fuel use and decrease greenhouse gas emissions. Studies show that biotech crops have saved farmers million gallons of fuel through reduced fuel operations – which in turn resulted in eliminating nearly 10.2 million pounds of carbon dioxide emissions since 1996. This is equivalent to removing four millions cars from the road in one year (Brookes and Barfoot, 2006).

Internationalization of intellectual property rights systems through the WTO has led to increased monopolisation, especially by transnational corporations, that are better able to charge higher prices for their products than if there were greater competition. Also, the high subsidization of and high tariffs on agricultural products constitutes the continuation of high protection of the agriculture sector in the rick countries (Khor, 2006).

Biotech crops is not a panacea; but they have the potential to make a substantial contribution in cutting poverty by half, by optimizing crop productivity, which can be achieved by public-private sector partnerships (James, 2014).

Among categorically minded experts there is an opinion that leaders of agricultural producers with huge producing capacities than conceal and hide the risks' seriousness to health and the environment from the cultivation of genetically modified crops and their industrial use.

Let's analyze environmental, agro technical and food risks (Figure 1-3).

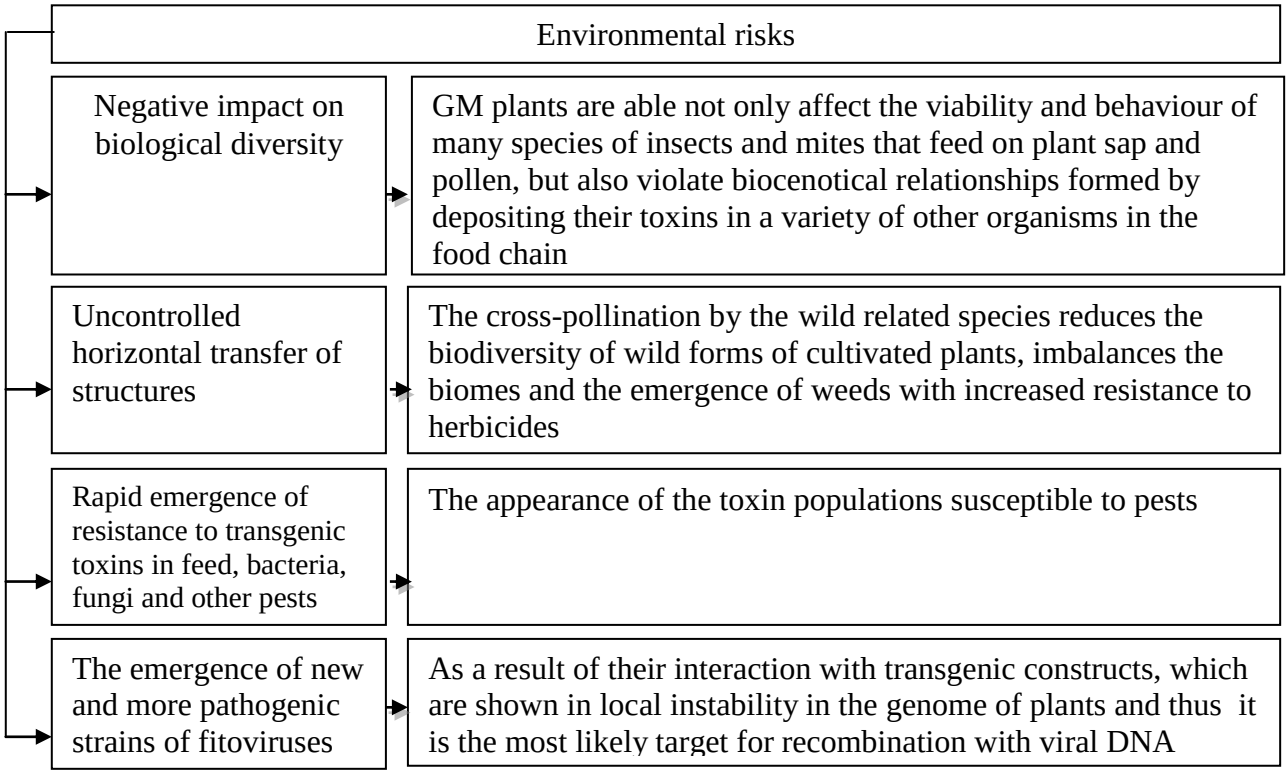

Figure 1. Envorinmental risks of biotechnological usage

Source: the Author

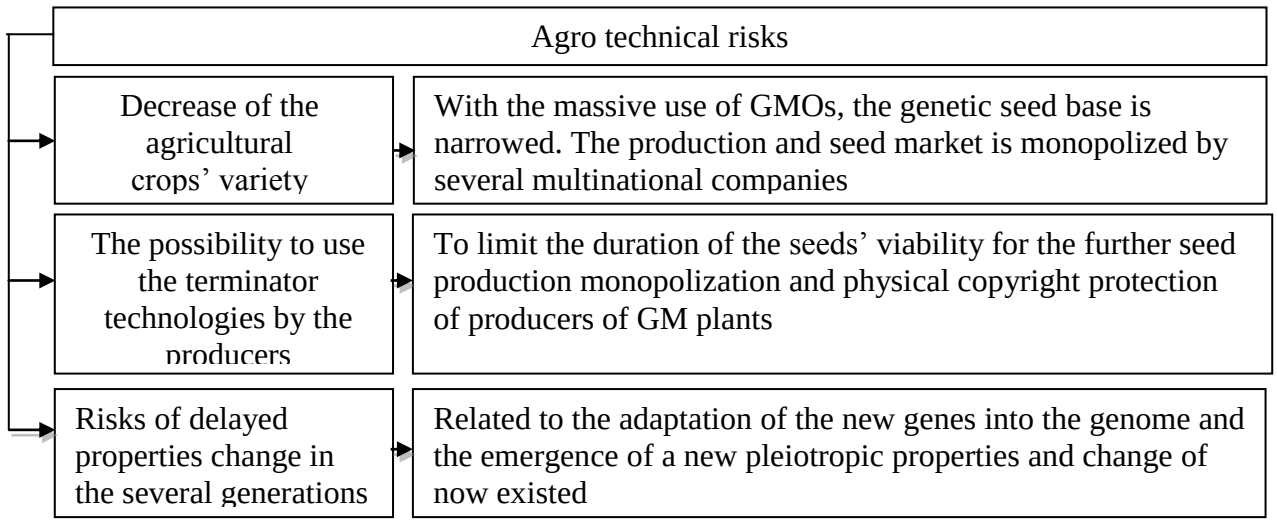

Figure 2. Agro Environmental risks of the biotechnology usage

Source: the Author

Today there are more than 500 kinds of pests which have developed immunity to conventional insecticides and are able to develop resistance to the biotoxins of transgenic crops (Bilyavsky, 2005).

The main cause of biological risks and adverse effects from the use of GMOs is instability of microorganisms' development.

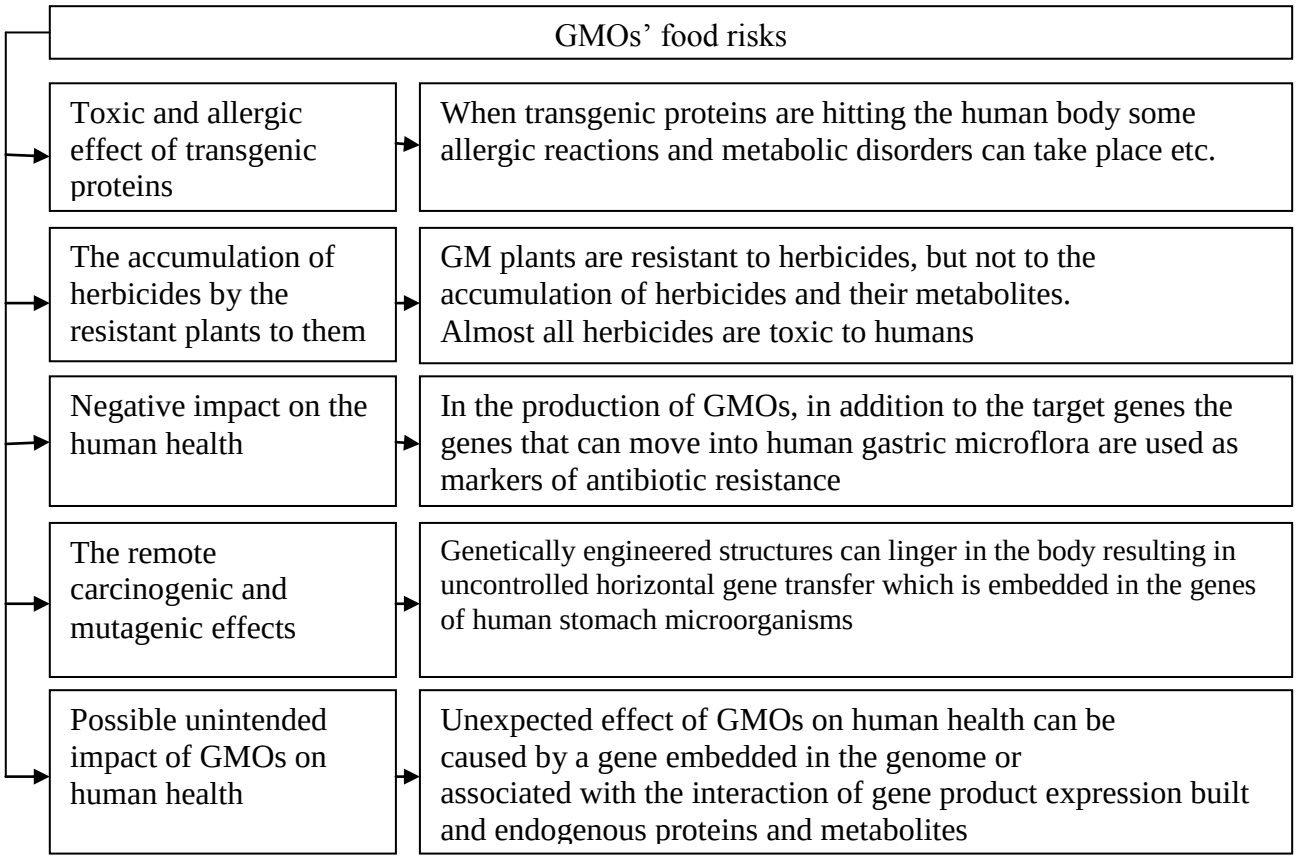

Figure 3. Food risks of biotechnological usage

Source: the Author

GMOs produced through genetic technologies have become a part of everyday life, entering into society through agriculture, research, and environmental management. However, while GMOs have benefited human society in many ways, some disadvantages exist. Therefore, the production of GMOs remains a highly controversial topic in many parts of the world (Encyclopædia Britannica, 2016).

Genetically engineered foods are beginning to flood the markets in the importing countries, yet no one can predict all their health effects on consumers, who are unaware that they are eating such food. Because genetically engineered food remains unlabeled, consumers cannot discriminate between genetically engineered

(GE) and non-GE food, and should serious health problems arise, it will be extremely difficult to trace them to their source. Lack of labeling also helps to shield the corporations that could be potentially responsible from liability (Lappe & Bailey, l998).

Scientists are concerned that biotechnology cannot provide secure food and reduce poverty in the developing world (Altieri and Rosset, 1999).

The list of countries affected by the policy of GM crops' introduction is significant and has its own characteristics. However, the common to all of them all is a negative influence of environmental pollution, destruction of natural biogeocenosis and the emergence of new species of plants and insects, which can not be coped. In addition, the number of lives is lost. GM seeds are transformed from a public good into "intellectual property" which you have to pay for. The typical behavior of TNCs, includes various kinds of absorption and destruction of small owners, and, therefore, took the unimaginable income by debt and demand payment. As a result, the farmers' indebtedness is growing, they are forced to sell their land for a pittance and fill the hungry army (Surovtseva 2013).

Conclusions. More stringent monitoring of compliance and implementation of legislation which is related to producers in Ukraine, could promote appropriate actions by checking manufacturers the information they put on their products, which they should be confirmed. Since the "No GMO" marking does not fulfill its main functions such as information, warning consumers about the quality and safety of products. That means that absence of confirmation is given fake. Today the issue of GMOs leaves a number of contradictions. On one hand we can not categorically state that consumption of GMO products is completely safe for humans as confirmation of this can be obtained through several generations. On the other hand it should be noted that until proven dangers of GMO products, its use is considered to be safe. However, the main of these contradictions is the idea that everyone should have the opportunity to choose their own - to take products with or without GMOs. The experience of the EU and the USA to create a regulatory system to prevent (the use of) GMO can play a special role in developing countries. In Ukraine, in particular, the need to ensure

harmonization of legislative and regulatory base, examining the real situation of the circulation of genetically modified crops and supplies in the domestic market, should be carried out with continuous monitoring of the GMOS' use in order to ensure the health of the nation.

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