



Crop production monocultures usually do not have much to do with biodiversity and the sustainability of natural ecosystems. Consequently, they are susceptible to a variety of viral, bacterial, fungal, protozoal diseases and the development of pests, including attacks by rapidly growing and infesting invertebrates. Pesticides and other chemical plant protection products are used to limit the development of plagues and epidemics of rapidly developing infectious diseases. In this way, chemicals that cause diseases in humans and animals, and have a negative impact on natural ecosystems, end up in the produced food and the natural environment.

Currently, sustainable organic farming is being developed to reduce the negative effects of this type of intensive agricultural production. Currently, due to the decline in agricultural production in some regions of the world and the need to reduce greenhouse gas emissions, the importance of changing the model of nutrition is growing.

The aim of reducing greenhouse gas emissions is the development of sustainable ecological agriculture, the production of plant crops, which are used to produce food products, primarily for people. Unfortunately, so far 3/4 of the area of crops cultivated has been used for the production of feed for livestock and not food for humans.

In addition, meat production on livestock farms generates large emissions of methane and other greenhouse gases. Methane, compared to CO<sub>2</sub>, is a greenhouse gas several times stronger in terms of generating the greenhouse effect. Besides, if this relationship was reversed 3/4 in favor of the production of food for people and not for animals, then the problem of hunger in many regions of the world could be quickly solved in this way. In



addition, greenhouse gas emissions would drop significantly and human influence in generating the global warming process would be significantly reduced. Of course, in addition to the aforementioned factor of industrial livestock farms, the key factors generating the greenhouse effect include: energy based on the combustion of fossil fuels, transport powered by combustion engines, industry powered by energy derived from the combustion of fossil fuels, heating of buildings based on the combustion of fossil fuels, progressing deforestation of forests and other green areas, etc.

In the future, due to the ongoing process of global warming and the growing scale of negative effects of this type of climate change, water shortages, droughts, fires, soil sterilization, etc. will increase and the risk of a decline in agricultural production. . It will be necessary to create new cultivars that will be more resistant to abiotic and biotic factors, i.e. against droughts, against pest attacks, against microbial diseases.

For many years, the creation of new varieties of crops has been based on the modification of the genome by, for example, adding a part of DNA isolated from bacteria or fungi in which a high level of resistance to a specific abiotic or biotic factor has been detected. In this way, new varieties of agricultural crops are created, which produce substances necessary for the production of certain pharmaceuticals, cosmetic products, various raw materials necessary for the production of certain industrial, energy and other products.

Due to the growing scale of food shortages, the pressure to produce in this way also food for people is increasing. Currently, the declines in the production of agricultural crops occurring periodically in some regions of the world are associated with



climate disasters, wars, and periodic plagues of pests and infectious diseases caused by microorganisms. In the future, the scale of the problem of falling food production may increase due to the progressing global warming.

By developing sustainable ecological agriculture to produce agricultural crops as food for people, the problem of food shortages, the problem of hunger in many parts of the world can be solved at the same time, and the level of greenhouse gas emissions can be significantly reduced.

In addition, the creation of more efficient and resistant to abiotic and biotic factors varieties of plant crops can significantly increase the level of productivity per ha of plant raw materials for the production of food products. As a result, the decline in cultivated land caused by melting glaciers and rising sea and ocean water levels can be counterbalanced in terms of the productivity of crops.

In addition, thanks to a significant increase in the productivity of agricultural produce per hectare, it will be possible to transform civilization degraded areas, areas with sterile soil into green areas through afforestation. In this way, the scope of restoring sustainability in the relations between the development of civilization and the natural environment will also increase, and the scale of the greenhouse effect will be limited, and the scale of the progressing global warming process may be limited. Therefore, the problem is multifaceted and determined by many interrelated component issues. Therefore, creating more disease and climate change resistant varieties of crops can be an important factor in sustainable organic farming.