# ORGANIC PRODUCTION - PROBLEMS AND THEIR SYSTEMIC SOLUTIONS (REVIEW)

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***Annotation:*** This article presents the existing problems in the production of organic products and the principles of organic farming in the countries of the world community and the Republic of Uzbekistan, as well as scientifically based proposals for their elimination. As a result of systematic analysis of state reforms and scientific research based on the principles of "Organic production" and "Organic farming" by the authors of the countries of the world community and Uzbekistan, wide introduction of production among the population and producers based on the principles of "Organic production" and "Organic farming" it was concluded that it is necessary for the government to take the status of "the main reformer" and implement systemic reforms to support the system of subsidizing producers from the economic side.

***Keywords:*** Problems in organic production, organic product, organic agriculture, organic production, biohumus, organic fertilizer.

***Introduction*** Growing agricultural products under the label of organic agriculture or organic products is causing enough problems even for the world's leading producers. In particular, practical attempts to solve the problem of reducing the cost of products by increasing the volume of production have a strong negative effect on the realization of organic products due to the existence of different forms of requirements for organic products between countries.

In the production of organic products in the world, especially under controlled conditions, including greenhouses, growing cucumbers with the organic product mark is one of the most important sectors of the economy. Cucumber is the largest cultivated vegetable in the world, and in recent years, as a result of the reduction of fertile land and the increase of soil and water salinity, it has become one of the main agricultural crops [Liu et al., 2020; Naglaa Taha et al., 2020]. Cucumber is one of the types of plants that occupy an important place in the food, pharmaceutical and cosmetic industries due to its deliciousness, freshness, and chemical composition rich in very important vitamins and chemicals [Vora., 2014; Mukherjee., 2013; Muruganantham., 2016].

Today, 87805086 tons of cucumbers are grown around the world [https://www.atlasbig.com/en-us/countries-cucumber-production]. The People's Republic of China takes the leading place in this production and supplies 70338971 tons of cucumbers to the countries of the world per year. That is, only the People's Republic of China produces 80% of the world production of cucumbers.

According to the international organization FAOSTAT (2020), in 2018, 1,984 million 75.2 million per hectare. tons of cucumbers are grown. In this regard, the People's Republic of China is one of the leading countries, among other things, the rate of cucumber cultivation per square meter in China is 53.86 kg, which is 42% higher than the rate of world countries [Muruganantham., 2016; www. fao org]. It is believed that the reason for the high yield of cucumbers in the People's Republic of China is that they are effectively using the regions of North China [Li., 2012; Sun., 2019].

In particular, North China has a very cold climate [Qiu., 2015; Abdalhi., 2016; Tang., 2020] is explained by the fact that seasonal crops such as cucumbers, tomatoes, peppers, citrus crops and leafy vegetables are currently grown not only in greenhouses, but also in solar greenhouses [Statistics., 2019; Zhang., 2020; Kubota., 2013; Sebastian., 2010; Lv., 2012]. Currently, the total area of greenhouses in the People's Republic of China is about 1.96 million hectares, and it is characterized by the fact that the main production is established in North China [Muruganantham., 2016; Huang., 2009].

The country of Turkey occupies the second place, its annual production volume is 1916645 tons. In the third place, the Russian Federation supplies 1,626,360 tons of cucumbers per year, and the United States of America takes the 9th place and produces 677,880 tons of cucumbers [https://www.atlasbig.com/en-us/countries-cucumber-production]. According to the statistics provided by the International Food and Agriculture Organization, between 2016 and 2020, the weight of cucumber cultivation increased by 3.7%, and in 2019, 87976103 tons of products were produced.

Cucumber ( *Cucumis sativus* L.) is an important vegetable crop belonging to *Cucurbitaceace family and has 2n=14 chromosome number [Janapriya., 2010;* Krug., 2002; Kubota., 2013]. is grown in large quantities in South Asia, especially in the hot and humid climate of the Himalayan mountain range in Northwest India, and in countries located in North Africa. The climatic conditions of these countries correspond to the productivity requirements of cultivation with high temperature, humidity and light intensity with sufficient amount of water and nutrients. Cucumber cultivation in India dates back to 3000 BC, and in China 100 BC [Arunabha Pal., 2020].

Cucumber ( *Cucumis sativus* L.) is the fourth most cultivated crop in open fields and greenhouses after potatoes, tomatoes and onions [ Ali., 2019b; Sun., 2019]. Cucumber is considered the most cultivated plant in greenhouses in the world [Sharma., 2018; Singh, 2005; Bairagi, 2013; Egel, 2015; Fernandes., 2002], is characterized by the fact that a lot of scientific and research work has been carried out on the growth of cucumber in the process of cultivation in greenhouses, its physiology, biochemistry and factors affecting productivity [Sharma., 2018; Savvas., 2013].

In the Netherlands, the most developed protected area vegetable growing, the area of greenhouses in 1980 was 16 thousand hectares, and by 1995 it exceeded 22 thousand hectares, the average annual growth of the greenhouse area during this period was 500 hectares. In Italy, a significant increase in protected areas began in the 1960s, and by 2000, the area of greenhouses had increased more than 60 times.

Bulgaria, Romania and Poland, which did not have a protected area for production 20-25 years ago, are now among the most developed countries with a protected area of vegetable growing. Today, this area is 1500 hectares, and in the United States of America, protected areas are 3500 hectares. In Commonwealth of Nations member states, protected areas are about 30,000 hectares, of which 60 percent are covered with film and 40 percent are glass greenhouses. Globally, the market for organic agricultural products is developing year by year. In Central Asia and the Republic of Kazakhstan, the organic agricultural product market is forming and developing at different stages [Karamatov, 2021 ]. Although some progress has been made in this regard, general and local problems still exist. For example, these include obtaining international standards for organic products, insufficient information on the state of the domestic and regional markets, different approaches to the organization and assessment of organic agriculture [Karamatov, 2021].

**Discussion. Existing problems in organic agriculture in Uzbekistan and their explanation.** The government of Uzbekistan, fully aware of the scale of environmental problems in the world, is giving priority to the development of the agricultural sector without harming natural resources. Therefore, the development of organic agriculture and the promotion of ecologically clean and sustainable production systems are an important factor in increasing the competitiveness of local products and increasing the export potential [Yusupov, 2021].

A large scientific research institute called FiBL and IFOAM (Research Institute of Organic Agriculture FiBL and IFOAM – Organics International) is engaged in collecting, analyzing and monitoring data on organic agriculture worldwide [Rajiv., 2010 ] . According to the statistical data of the International Organic - FiBL and IFOAM scientific research institute, in 2020 the gross sales volume of organic products will be 14 billion. increased by 120 billion euros. reached the euro. In 2021, the demand for organic products also showed a sharp increase compared to 2020 (Table 1).

Also, the area of land dedicated to organic agriculture worldwide increased by 1.6% to 75 million. per hectare was recorded [Helga., 2022]. 74.9 million in 2020. More than 100,000 hectares of land, land areas where organic agricultural products are grown and conserved areas are recorded [Helga., 2022].

*Table 1*

**Organic agriculture key indicators and advanced countries**

*[ FiBL survey 2022]*

| **Indicator** | **States** | **Advanced countries** |
|---|---|---|
| Countries with organic activity [1] | 2020: 190 countries | |
| Areas of land suitable for organic agriculture | 2020: 74.9 mln. to (11 million in 1999) | Australia (35.7 million hectares)<br>Argentina (4.5 million hectares)<br>Uruguay (2.7 million hectares) |
| Percentage of area devoted to organic agriculture, relative to total area | 1.6% growth in 2020 | Liechtenstein (41.6%)<br>Austria (26.5 %)<br>Estonia (22.4 %) |
| Increase in organic agricultural crops in 2019-2020 | 3.0 mln. to; growth +4.1% | Argentina -781,000 ha (+21 %),<br>Uruguay - 589,000 ha (+28%)<br>India: 359,000 ha (+16%) |
| Wild collection and other non-agricultural land areas | 2020: 28.5 mln. ha (in 1999: 4.1 million ha) | Finland - 5.5 million ha.<br>Namibia - 2.6 million ha.<br>Zambia - 2.5 million ha |
| Producers | 3.4 million in 2020. producer (200,000 producers in 1999) | in India - 1,599,010;<br>in Ethiopia - 219,566;<br>Tanzania - 148,607. |
| Trade in organic products | 120.6 billion in 2020. euros ( 15.1 billion euros in 2000) | USA - 49.5 billion. euro<br>Germany - 15.0 billion. euro<br>France - 12.7 billion. euro |
| *Source: http://unstats.un.org/unsd/methods/m49/m49regin.htm .* | | |

The largest organic agricultural land is recorded in the Oceania region, which (35.9 million ha) accounts for almost half of the world's organic agriculture [Helga., 2022]. European countries 17.1 mln. ha (23%), Latin America for 9.9 million (13.3%), Asian countries for 6.1 million (8.2%), North America for 3.7 million (5.0%) and in African countries, 2.1 million (2.8%) land areas are allocated to organic agriculture [Helga., 2022].

In 2020, organic agricultural land will be 3.0 mln. per hectare increased (4.1%), the highest indicators were in Chile by 650% or 0.135 mln. per hectare (mainly due to the increase in organic pasture areas) and in Papaya-New Guinea the organic agricultural land area increased by 322% (more than 72000 hectares) [Helga., 2022].

From Table 2, it can be seen that the least area is allocated to organic agriculture among the MDGs only in Uzbekistan. India is becoming one of the leading countries in the world in terms of growing organic agricultural products.

Veeresh (1999) states that organic farming should be considered as one of the alternative methods to conventional agriculture to sustain production without causing serious damage to the environment and ecology. However, his said different _ Organic farming is accepted in different countries.

While in developed countries its focus is on preventing chemical pollution, in India it is seen as a method of improving soil fertility. In this, even the ability of the soil to absorb fertilizers is considered to depend on the organic content of the soil [Veeresh. 1999].

Table 2

**Areas of land intended for organic agriculture (ORA) around the world** (calculated by adding land areas under preparation)

[FiBL survey 2022]

| No | States | Area, hectares | No | States | Area, hectares |
|---|---|---|---|---|---|
| 1 | Australia | 5687799 | 10 | Germany | 1702240 |
| 2 | Argentina | 4453639 | 11 | Russia | 615188 |
| 3 | Uruguay | 2742368 | 12 | Ukraine | 462225 |
| 4 | India | 2657889 | 13 | Kazakhstan | 114886 |
| 5 | France | 2548677 | 14 | Azerbaijan | 38080 |
| 6 | Spain | 2437891 | 15 | Kyrgyzstan | 30259 |
| 7 | China | 2435000 | 16 | Tajikistan | 11818 |
| 8 | USA | 2326551 | 17 | Belarus | 6838 |
| 9 | Italy | 2095380 | 18 | Uzbekistan | 3781 |

***Note:*** *168 countries around the world are included in this list, and the author selected the countries with the largest land use areas and the MDX countries [FiBL survey 2022]*

It is known that the cultivation of vegetable products in greenhouses is strongly different from each other according to the type and variety of vegetables, their growth phases and the applied agrotechnological methods. There are several problems in the cultivation of vegetables based on the principles of organic agriculture or organic products. Uzbekistan also has problems similar to those of the world community, but there are also specific differences based on the economic capabilities of the countries.

We consider it appropriate to interpret these problems in the following order:

*firstly*, there is a huge demand for agricultural products, which creates the need to grow a large amount of products in a short period of time;

*secondly*, the production weight of biological fertilizers used in organic production is not sufficient and the productivity of organic production is currently low compared to products grown on the basis of traditional mineral fertilizers;

*thirdly* - during the cultivation of organic products, fertilization should be carried out based on the soil's demand for organo-mineral fertilizers, in which it is possible to replace mineral fertilizers with biological fertilizers, but it is definitely strong in the fight against various diseases, pests and weeds from agricultural fields or greenhouses they are forced to use chemical means, which is explained by the fact that biological fertilizers or means have a slow effect;

*fourth* - despite the fact that there is a strong effort to introduce organic products or the principles of organic agriculture in practice, the price of organic products is higher for daily consumption based on the economic potential of the population;

*Fifthly*, there are extremely strict requirements for the cultivation, storage and sale of products obtained on the basis of the principle of organic agriculture or organic products, including the requirement not to use genetically modified varieties in the cultivation of organic products. indicators remain several times lower than modified varieties;

*Sixth* - in solving the above-mentioned problems, because each country implements approaches based on its economic and social capabilities, there are strong differences between developed and developing countries with strong agricultural production and countries in the lower ranks, which means that organic products grown in countries with limited economic capabilities prevents the export of products to foreign countries based on the high cost, based on the established requirements, that is, the ability to fulfill the requirements set by countries with strong agricultural development is limited, to prevent the wide sale of organic products ;

*Seventhly*, in the territory of the former Union, in the territories of the independent commonwealth states, including Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan, the use of a very large amount of chemical pesticides in the soil conditions in the last century, soil degradation, the sharp increase in the level of soil and water salinity, desertification. due to the expansion of the territories and the uneven distribution of transboundary waters suitable for agriculture and the incomplete satisfaction of the demand for water, the opportunities to fully implement the principles of organic agriculture or growing organic products are becoming limited;

*Eighth* - the use of non-traditional methods in addition to the traditional methods of growing organic products (large-scale open field areas, large-scale or small-scale closed system greenhouses and greenhouses), thereby considering the lack of knowledge and skills of the population to meet their demand for some organic products as a major problem must In particular, people living in high-rise buildings or living in areas where there is no possibility of farming in small yards should be widely promoted and given attention to these processes at the government level.

*Ninthly* - if seasonally 10-20 kg is obtained per one square meter in ordinary open fields, 30-35 kg can be obtained for a long time in closed system greenhouses with a good and continuous heating system. outages, problems in the uninterrupted supply of electricity, gas, coal or other types of fuel sources by the government have a strong negative impact on the operation of greenhouses. An important role is played by the government's guarantee of a continuous supply of fuel and lubricants for the cultivation of agricultural products. There are cases of death of seedlings or crops grown in greenhouses for several days or hours. In particular, a large amount of tomatoes and cucumbers in greenhouses were lost as a result of the anomalous cold that occurred in the Republic of Uzbekistan in 2022. Wide use of solar panels, biogas production devices, and wind generators in providing greenhouses with lighting and continuous heating system is one of the main factors in reducing the cost of the grown product, as well as helping to meet the demand for heat;

*Tenth* - with the support of the government or international donor organizations, it is appropriate to focus on the establishment of greenhouses specializing in the cultivation of large organic products in areas close to areas with continuous heat and electricity. In particular, large-scale hot water, electricity and gas production enterprises, as well as large-scale production plants (mineral fertilizers, coal, metal production) where a large amount of hot water, steam or gas are produced, set up greenhouses, and the heat generated in the enterprise effective use of resources has a positive effect on the efficiency of production of organic products.

*eleventh* - providing continuous subsidies to organic production enterprises and wide implementation of the state compensation system for natural disaster damages in the event of anomalous climatic conditions also play an important role in the sustainable development of the organic agriculture network. In particular, when growing agricultural products, especially vegetables, in non-traditional methods compared to the traditional method, the productivity decrease is 10-12%. In general, in organic agriculture, yield reduction of up to 20% of the expected volume is a moderate process [Li., 2017b]. Such a decrease in productivity is widely observed in organic vegetable growing, including 10-24% in cabbage cultivation, 6-7% in radish cultivation [ Chen., 2019], and a high yield decrease of 25-37% is observed in carrots and cabbage [Li., 2017a]. A very large decrease in productivity in the cultivation of organic products is recorded up to 65-90% in the cultivation of potatoes, onions, peas, carrots and cabbage [Ni., 2019; Panwar., 2011].

Therefore, the government's support of greenhouse farms established on the basis of the principle of organic agriculture until they reach stable economic indicators in accordance with the initial development and market requirements, by providing subsidies and tax breaks, is one of the important strategic tasks in the development of organic agriculture. Also, one of the important factors is the fact that the state buys the grown product and guarantees its sale.

**Conclusion.** The cultivation of agricultural products in the world on the basis of a large amount of chemical fertilizers and pesticides causes serious ecological problems related to severe damage to the environment and human health. The widespread use of biological fertilizers in the process of growing agricultural products is very important in controlling the amount of heavy metals in the soil, as well as in the production of ecologically clean products. The quality indicators of the products grown in traditional agricultural methods, including the chemical composition, the preservation of fruits and products of the chemical agents used, and the negative consequences of the excessive use of mineral fertilizers, such as accumulation in the product composition, have a sharp impact on human health, which has been a factor in the rapid development of organic agriculture in recent years. is serving. In the field of fruit and vegetable growing in the world, one of the important factors of the technology of growing cucumbers in greenhouse conditions is the preparation of cucumber seedlings, and the quality of seedlings is considered as a factor that directly affects productivity. Therefore, special attention is paid to wide implementation of the norms of use of biofertilizers used in the preparation of seedlings in the process of growing organic agricultural products in greenhouses, agrotechnologies of application, and continuous control systems of the safety indicators of the used biofertilizers.

Systematic work is being carried out in our republic, especially after independence, to stabilize the ecological situation and to accelerate the processes of biologicalization in the production of agricultural products. In particular, the Law "On Organic Products" was adopted in Uzbekistan, and the basic requirements for organic products and production of organic products were put into practice [Law of the Republic of Uzbekistan, 2022].

This, in turn, causes the need for wide use of biological fertilizers in the process of production of organic products in agriculture. In the new development strategy of the Republic of Uzbekistan [ Decree of the President of the Republic of Uzbekistan, 2022 ] and the state program of the President of the Republic of Uzbekistan dated February 28, 2023, "the new development strategy of Uzbekistan for the years 2022-2026" in the "year of attention to people and quality education" PF-27 decree on "...innovative developments on the cultivation of exportable products and the development of fruit and vegetable growing, increasing the area of intensive gardens by 1.5 times and greenhouses by 1.2 times, increasing soil fertility and protection" tasks of wide introduction into practice are defined [Decree of the President of the Republic of Uzbekistan, 2023 ].

In the implementation of these tasks, it is important to conduct research aimed at controlling the agrochemical properties of the soil in the conditions of greenhouses in Uzbekistan and the effective use of biological fertilizers in the cultivation of ecologically clean products based on the principles of organic agriculture.

In Appendix 1 of the Cabinet of Ministers of the Republic of Uzbekistan Decision No. 729 of November 18, 2020 "On Approval of Certain Regulatory Legal Documents on the Safety of Organic Products and Raw Materials and Organic-Mineral Fertilizers" on the procedure" was approved [Decision of the Cabinet of Ministers of the Republic of Uzbekistan, 2020] , in which biohumus is defined as follows: biohumus (vermicompost) is an organic fertilizer obtained as a result of the processing of organic waste of earthworms. manure of other animals) high molecular organic compounds formed by the processing process (except for those fermented from rabbit, bird droppings, hay, tree leaves, food industry and household waste). Producers of organic products in Uzbekistan currently produce organic products only on the basis of biohumus produced on the basis of earthworms, according to the procedure approved by this decision.

Production of organic agricultural (farming) products, organization of processes, agrochemical, ecological and biological monitoring, establishment of specific requirements for developed products, certification and scientific and methodological coordination of the system by international organizations, local and foreign scientists many scientific and research works have been carried out. In Uzbekistan, scientific research work on the production of organic products in greenhouse conditions, monitoring the amount of mineral substances and heavy metals in the soil, as well as controlling the amount of chemical elements in the finished product has not been carried out.

Our systematic observations on the production of products based on the principle of "Organic products" or "Organic farming" show that cucumbers, tomatoes, bell peppers, hot and hot peppers can be recognized as promising products grown in greenhouse conditions in Uzbekistan. Until now, only one production cluster has tried to implement the cultivation of "Organic cotton" in open fields (Namangan region, Pop district). But due to the many reasons mentioned in the existing problems listed above, no positive progress is being observed in the cultivation of organic cotton, organic tomatoes, organic cucumbers, and organic bell peppers.

In addition, sorrel (*Rumex*), spinach (*Spinacia*), jag-jag (*Sapsella Bursa Pastoris Medic*), Asian mint (Mentha asiatica), mountain Greens such as basil (*Origanum titthanthum*) are very popular in the spring.

Over the last twenty years, the growing of these greens in indoor greenhouses and their sale to neighboring countries has been widely developed. The agrotechnology of growing these greens in greenhouse conditions with the extensive use of mineral fertilizers is being widely implemented. But one of the biggest problems that appear when these greens are grown on the basis of mineral fertilizers is that they accumulate nitrate salts on a large scale in their bodies. Therefore, promoting the cultivation of these medicinal and medicinal herbs in greenhouse conditions as organic products or based on the principles of organic agriculture serves as another factor in increasing the country's export potential.

As a result of a systematic analysis of state reforms and scientific research based on the principles of "Organic production" and "Organic agriculture" in the countries of the World Community and in Uzbekistan, the following conclusion can be reached: between the population and producers of the production of products based on the principles of "Organic production" and "Organic farming" for wide implementation, it is necessary for the government to take the status of "the main reformer" and to carry out systematic reforms to support the system of subsidizing producers from the economic side.

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