

## **THE IMPORTANCE OF BIOFARMING IN THE CONDITIONS OF GLOBAL CLIMATE CHANGE**

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**Аннотация:** В этой статье речь идет об обеспечении продовольственной безопасности в условиях глобального изменения климата с использованием современных методов биоземледелия адаптированным способом, а также адаптация ухода за растениями к изменениям климата, обоснование важности эффективного использования биологически активных веществ и агротехнологий

**Abstract:** This article is about ensuring food security in the context of global climate change using modern biofarming methods in an adapted way, as well as adapting plant care to climate change, justifying the importance of the effective use of biologically active substances and agricultural technologies

**Ключевые слова:** Глобальное изменение климата, эффективное использование биологически активных веществ, биоземледелие, продовольственная безопасность, современные агротехнологии и экономическая эффективность.

**Keywords:** Global climate change, efficient use of biologically active substances, biofarming, food security, modern agro-technologies and economic efficiency.

**Enter.** In the conditions of global climate change, protection of all life from negative consequences, wide use of scientific achievements, as well as acceleration of the use of modern technologies that save time and money are among the main problems today. These problems can be realized by wide use of innovations in the cultivation of plants adapted to changing climate conditions, assimilation of foreign experience, and the use of new low-cost and effective methods of agriculture.

There are perfect and complex ecosystems on Earth, in which every living thing has a limited place. We know that trying to completely eradicate a plant, animal and/or insect species teaches them to be resilient, but that resilience does not guarantee that they will be completely preserved.

In order to combat climate change, adapt and prevent losses, effectively use natural resources, and protect the biological ecosystem, it is necessary to study climate memory and climate migration, determine land degradation, conduct clinical examinations, and systematically study the problems and consequences of climate change on plants and animals. - it is necessary to carry out the activities in a timely manner in the cross-section of sectors. Most importantly, the development and use of multi-functional, cross-sectoral, science-based and integrated biological approaches are required to effectively promote climate change adaptation and mitigation of the sector's negative impacts on climate.

Farming refers to the system of measures used in agricultural land use and crop cultivation, as well as measures to maintain and increase soil fertility, rational use of land, and high and sustainable crop yields.

### **2. Analysis of literature on the topic.**

- Fundamentals of farming, soil science and agrochemistry: textbook for students of economic (agricultural) education, Ministry of Agriculture and Water Management of the Republic of Uzbekistan; Tashkent State Agrarian University.-T.: Economy-Finance, 2006,-182 p.

Agriculture and soil science are twin concepts. Therefore, it is impossible to advance the science of agriculture without knowing the condition of the soil. Some aspects of agriculture, soil science and agrochemistry are reflected in the textbook. In particular, a number of issues such as soil formation, mechanical composition, classification, agrophysical properties, the history of agricultural development, methods of tillage, weed control, basics of agrochemistry, and types of fertilizers are discussed. In a nutshell, the secrets of modern farming science are expressed in this textbook. The scientific works carried out in Uzbekistan in the field of improving soil conditions, increasing their productivity and effective use are highlighted.

In order to grow a high and stable crop in agriculture, it is necessary to follow the law of the minimum. In this case, it is necessary to bring the minimum or maximum factors to the optimal amount with specific measures, to create favorable (optimal) conditions for the growth and development of the plant during the entire vegetation period.

In agriculture, farming is very important. More than half of the gross agricultural output comes from farming, and the rest from livestock. Farming consists of fields, horticulture and viticulture. According to types of crops, grain crops, technical crops, fodder, vegetables, potatoes and sugarcane crops are divided into farms.

### **3. Research methodology.**

Biofarming is non-traditional farming, which means the use of biological properties of organisms and microorganisms, as well as the natural compounds formed in farming. Also, biofarming serves as an ecological and ecological-genetic principle of maintaining soil fertility, increasing productivity, protecting plants.

In organic farming, the amount of organic matter (fertility) and moisture in the soil increases and the consumption of harmful nutrients is limited. Importantly, the stability of organic matter increases in fertile soil, and the main thing is that it releases carbon dioxide from the soil. Instead, using organic production methods that conserve soil carbon by adapting to hot and dry climates is more effective in countries with climate challenges as well as difficult climates. Special attention should be paid to mitigating the difficult climate change conditions in agriculture, reducing environmental damage by studying available opportunities, in particular, maintaining soil moisture and fertility, as well as biodiversity, and limiting environmental pollutants.

One of the main features of soil microorganisms is that they provide plants with nitrogen and phosphorus. Small bacteria live in the roots of plants that convert molecular nitrogen in the air into biological nitrogen. These bacteria give the soil the qualities of fertility and productivity. Biofertilizers are a cheap, environmentally friendly and fast-acting alternative. It also helps to absorb mineral fertilizers. In practice, using biofertilizer suspension, wheat and cotton yield is twice as much as compared to the traditional method. Biofertilizers restore the biological condition of soils and preserve microorganisms by multiplying useful cells up to a billion times.

On their own, microorganisms begin to live in the root of the plant with organic compounds, therefore, they are interested in the long life of the plant, therefore, they supply all the necessary compounds to the plant.

And carbon sequestration in the soil helps to create organic matter for increasing organic fertilizers, applying crops and green manures, pastures, trees or permanent hedges, etc., and using cheaper and local materials can make a good profit. Conventional agriculture uses more public energy than organic systems because of the reliance on energy-intensive fertilizers, chemicals, and concentrated nutrients discarded by organic farmers.

An important chemical substance for plant growth and development

this is nitrogen. Both chemical and biological nitrogen-forming bacteria and their unique compounds are widely used in foreign experiments. These meniral nitrogen-fixing bacteria belong to the Azotobacter, Azospirillum, Rhizobium, Nostoc, Anabaena series, and various biofertilizers are made from them. These biofertilizers increase soil fertility, accelerate plant development up to 14 days, and improve soil quality.

Bacteria dissolve insoluble phosphorus fertilizers in the soil and turn them into forms that are easily absorbed by the plant and fill the plant's need for phosphorus in a biological way. Phosphorous fertilizers used in agriculture do not dissolve very well, so phosphorus is not absorbed by the plant.

While phosphorus is considered an important chemical substance in plant development, it has been scientifically proven that if nitrogen and phosphorus do not react sufficiently to each other, the planned harvest cannot be obtained. Therefore, the use of bacteria that quickly absorb phosphorus fertilizers that are insoluble in the soil can increase soil fertility and productivity. In the conditions of Uzbekistan, various plant diseases, especially viral and/or fungal diseases, have been detected. For example, as a result of infection of cotton with various pathogenic fungi, there are cases of drying of the seed until it forms a true leaf. Unfortunately, we use agrochemistry without studying the species, physiology and other natural characteristics of fungi.

#### **4. Analysis and discussion of results.**

Biofarming reduces the risk of vulnerability to climate change and variability while ensuring economic security. For example, bio-farming can cover all aspects of agriculture, thereby increasing seasonal income, ensuring soil fertility, and adapting to climate change and its negative effects, including difficult climate conditions. This optimal solution provides economic security at the same time. The result is a low-cost, strategically reliable solution that minimizes the adverse effects of adverse weather or climate change.

Climatic conditions provide the population of countries with food products, prevent shortages and economic risks. In the near future, the average temperature on the planet Earth will increase by 4°C, as a result of reducing the emission of greenhouse gases from economic sectors into the atmosphere, and not taking timely measures to adapt to climate change, agricultural land may become unusable.

Reducing greenhouse gas emissions in agriculture, developing ecologically stable and resilient models of agricultural and food production in the face of climate change, financial support for scientific and practical projects in the field, and directing investments based on knowledge and innovative technologies. Agriculture is important in Uzbekistan, and in recent years, about 27% of the

total annual gross domestic product has been accounted for by agriculture, forestry and fisheries. In recent years, 3.6 mln. people are working, and the total employment is approx 6 percent.

According to the analysis, by 2030, due to climate change, the available water resources in Central Asia are predicted to decrease by 5.9 percent. The reduction of available water resources has a serious impact on the economy, especially on agriculture (90 percent of the total water resources are consumed in the sector). Also climate change drought and leads to the aggravation of desertification processes, pasture and land degradation, soil salinization, wind erosion, and increase in plant pests and diseases.

Failure to take prompt measures to adapt to climate change and effective land and water management models will lead to food shortages, reduced soil fertility, and reduced water supplies. As a result, the yield of many crops in some regions will decrease by 12-50 percent in the next decade. Agricultural sectors are also sufficiently affected by climate change. 189.2 million to the atmosphere in the country. tons of CO<sub>2</sub>-equivalent greenhouse gases were emitted, of which 33.7 mln. tons of CO<sub>2</sub>-eq (17.8 percent) fell on agriculture. In our country, the agricultural sector is the second largest sector that causes the emission of greenhouse gases (the first place is energy - 76.3%).

At the 2021 annual conference of the United Nations on climate change, the Republic of Uzbekistan decided to reduce greenhouse gas emissions per unit of the country's gross domestic product (GDP) by 2030 from the 2010 level. Participated in the 35 percent reduction initiative.

## **5. Summary.**

In farming, in addition to knowledge and experience, physical strength, especially manual labor, is required. Farming also has its own science, without such science, farming cannot be done. It is necessary to know how to choose land or seeds, to know how to irrigate, to know how to care for and cultivate crops, to know how to use the land effectively, to know how to alternate crops, to know the possibilities of getting crops from one crop several times a year. However, manual labor is also required in this profession, unfortunately, productivity is decreasing today due to improper treatment of land and nature.

Selection of varieties (hybrids) adapted to soil-climate conditions in the cultivation of crops in bio-farming, good tillage and application of fertilizers in cultivated areas, as well as preparation of seeds for sowing, sowing dates, seed sowing norms, sowing method, planting depth, crop maintenance, soil cultivation, it is necessary to implement all measures for feeding, weeding, protection of crops from pests and insects, application of defoliants and desiccants.

### **Offers:**

- it is necessary to create drought-resistant crop varieties and make effective use of water-saving technologies by developing agro-technology in bio-farming, taking into account the factors of climate change.
- implementation of complex measures aimed at increasing soil fertility, minimal tillage and popularization of planting without plowing.
- development of new standards for irrigation of agricultural crops by cleaning waste water and using it in agriculture, as well as adapting it to soil and climate conditions.
- wide implementation of new innovative technologies for protection against various diseases and pests.

- creation of an online platform and database that helps to monitor climate changes in agriculture and implement agrotechnical measures.
- financing through state grants all scientific research on adaptation to climate change and mitigating the negative impact of the sector on climate.
- systematic organization of international seminars-trainings and internships aimed at increasing qualifications in advanced foreign countries.
- Timely implementation of interrelated reclamation and organizational measures aimed at efficient use of land, restoration and increase of soil fertility, high and stable yield from crops.

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