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INNOVATIVE TECHNOLOGIES OF SOIL PROTECTION IN QUALITY GROWING OF AGRICULTURAL PRODUCTS

Raxmonov Akramjon Xujamovich
Employee of the Institute of General and Inorganic Chemistry of the Academy of Sciences
rakhmonovakrom816@gmail.com

Kuchkarova Nodira Pazitdinovna
Associate Professor of Tashkent State Agrarian University
nadira-66@mail.ru

Maxkamova Aliya Shinibaevna
Assistant at Tashkent State Agrarian University

Abstract
At present, when the threats of the global ecological crisis are growing, the protection of soils from degradation processes is considered one of the urgent world problems. The importance of this problem lies in the fact that it is impossible to preserve the flora and fauna, the purity of water and air without eliminating the process of soil degradation, without preserving the soil layer of the earth. 100 million in many countries of the world (Brazil, New Zealand, Mexico, United States of America, China, India, Pakistan, Turkey, Russia, Kazakhstan, etc.). Agricultural products are grown using resource-saving and soil-protective technologies in agriculture on more than 100,000 hectares of land.

Keywords: Innovative technologies in soil protection, resource-saving technologies, degradation processes.

Introduction

It is necessary to implement complex innovative projects based on large-scale scientific programs aimed at solving the most important tasks for the national interests of our country. The subject breaks away from uniformity and fragmentation. The elimination of interdisciplinary and interdepartmental barriers is ensured. The perspective that promotes cutting-edge ideas and works at the level of world scientific achievements is to directly support and encourage talented scientists who are able to apply scientific results for the benefit of the country", opens the way for encouragement. Climate change directly and indirectly affects soil degradation. This directly leads to an increase in the release of excess gases, mineralization of soil organic matter under aerobic conditions (CO2) and under anaerobic conditions (CH4). Soil degradation also increases N2O emissions from denitrification. Indirectly, in accordance with soil degradation, the efficiency of biomass use decreases, the impact on the quality and quantity of biomass increases.

Soil degradation, water (affecting biomass productivity by creating drought or anaerobiosis) and natural balance in the root zone (degradation), reduction in effective root depth and increased susceptibility to pests, soil degradation affecting water quality by transport of suspended and dissolved substances from the surface affects water and ground water, agrochemicals Optimization of soil conditions during the growth and development of crops in agriculture is one of the most important factors in plant life. Of course, this is achieved through scientifically substantiated mechanical tillage, that is, through the cultivation of the arable layer of the soil, favorable conditions are created for the growth and development of crops, and soil fertility is increased.

Water and wind erosion, along with the washing out and blowing out of small particles of the surface fertile layer of the entire area, leads to a decrease in soil moisture and an increase in its mineralization. Therefore, one of the simple, inexpensive and effective ways to reduce soil erosion, improve the structural-aggregate state, and increase humus and nutrient reserves is to reduce the depth and number of plowing and enrich the soil with organic matter due to plant care. residues in the soil.

Research methods. In agriculture, there are many areas of resource-saving and soil-protective technologies. Including;

No-Till - direct seeding without tillage on a level surface, leaving plant residues on the soil surface.

Permanent bed planting - planting on a bed without direct plowing, with covering the surface with plant residues.

Intermediate tillage - plowing for one year, leaving plant residues on the soil surface, tilling the soil and sowing it on a flat area or rice field, without tilling the next year.

Minimal tillage – plowing the soil with chisels or ram without ploughing, leaving plant residues on the soil surface, and is divided into several other types of sowing.

Results of the study and their discussion. Resource-saving technologies, including no-till planting, have significantly changed soil fertility in the 0-20 cm surface layer compared to traditional plowing; with resource-saving and soil-protective technologies, the amount of humus in a 0-7 cm soil layer was higher on average by 0.5-0.8%, compared with the usual method of tillage. Resource-saving technologies are mainly interpreted in the sense of

reducing various land cultivations (plowing, chiselling, threshing and other agrotechnical measures) or saving economic costs when growing crops. Soil protection is used in the sense of covering or mulching the soil surface with polyethylene film, plant residues, green manure, various composts, manure or other organic residues. According to research scientists, resource-saving technologies, including no-till planting, have significantly changed soil fertility in the surface layer of 0-20 cm compared to the conventional arable method; with resource-saving and soil-protective technologies, the amount of humus in a 0-7 cm soil layer was higher on average by 0.5-0.8%, compared with the traditional tillage method. (Egamberdiev O.Zh, Sobirov S.K, Volkov A. 2016)

It is known that sowing the main, intermediate and secondary crops in the fields throughout the year and caring for them require repeated tillage with the help of extensive machines aggregated with heavy tractors. This situation, on the one hand, leads to an increase in labor, energy and fuel costs, and on the other hand, to mechanical erosion and soil compaction. (Tashboltaev, A. Tokhtakoziev, B. Khushvaktov 2016)

When using resource-saving and soil-protective technologies, the physical and chemical properties of the soil are taken into account, including; soil salinity, bulk density, as well as reduced agricultural costs for tillage, while increasing soil infiltration, moisture, aggregate state, porosity, high yield and economic efficiency.

Free air fills the spaces and pores of the soil unoccupied by water and mixes with it, interacts with the atmosphere, in the case when the compressed part of the air is separated from the soil water in the pores, a certain part is absorbed by soil particles. The most important air for a plant is free air, and its amount depends on the porosity of the soil. In soils rich in minerals, the amount of air is from 30% to 80%, in soils rich in organic matter and at high humidity, it reaches 90%. The ratio of water and air in the porosity of the soil in which most crops are planted is considered good if it is 60.40 (%). Some plants thrive in reverse porosity (more water, less air).

The air properties of the soil mainly consist of air capacity, air permeability and aeration. Different concentrations of SO2 and O2 in the soil are due to gas exchange with the atmosphere, which is constantly maintained due to the absorption of O2 and the release of SO2 by the roots during respiration. Before seed germination, the soil layer is removed by light harrowing, technical and other plants are cultivated between the furrows of the sown fields. Additional agrotechnical measures lead to energy overruns and a decrease in economic indicators, therefore it is advisable to use centralized special machines that can cultivate the soil, taking into account the physical and chemical properties of the soil. At the same time, the use of organo-mineral fertilizers with the possibility of improving the chemical properties of the soil, planting rotation, chemical reclamation, perennial grass plantations and other measures will prevent soil compaction.

The study of soil salinity and salinization has its own history in soil science. In particular, scientists have carried out extensive theoretical and practical studies of soils in countries with developed soil salinity, poor reclamation conditions and low productivity. All studies were carried out at the scientific and technical level in accordance with the history of that time.

The study and reclamation of saline soils developed in parallel with the development of fundamental sciences. One of the main causes of salinization and salinization of soils is the accumulation of a large amount of electrolytes in the soil solution and interaction with the solid phase of the soil. The principles of this process and the reasons for its occurrence are well studied today.

Conclusion. The introduction of new agricultural technologies in agriculture immediately on large areas requires farmers to take great risks. To prevent this, farmers are advised to first try conservation agriculture on small plots. After all, a farmer must master this non-traditional method of cultivating crops, gain relevant experience, and thoroughly analyze costs and income. As a result, the farmer has a deeper understanding of the new agricultural technology.

To reduce the negative impact of wheels during tillage, use combined and extensive units that perform two or more technological processes in one pass of the field, and use herbicides instead of mobile machines in weed control.

List of Used Literature

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