

STUDY OF THE CAUSES OF SOIL FERTILITY DECLINE

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Annotation: This article is devoted to the study of the causes of soil fertility decline, its consequences, and ways to solve this problem. The article analyzes the impact of various factors, such as agriculture, industry, and environmental factors, on soil fertility. In addition, recommendations for the preservation and restoration of soil fertility are given.

Keywords: Soil fertility, erosion, salinization, waterlogging, desertification, consequences, solutions.

Аннотация: Данная статья посвящена изучению причин снижения плодородия почв, его последствий и путей решения данной проблемы. В статье анализируется влияние различных факторов, таких как сельское хозяйство, промышленность и факторы окружающей среды, на плодородие почвы. Кроме того, даны рекомендации по сохранению и восстановлению плодородия почвы.

Ключевые слова: Плодородие почвы, эрозия, засоление, заболачивание, опустынивание, последствия, решения.

The main reasons for the decline in soil fertility are erosion, nutrient deficiency, salinization, waterlogging, desertification, soil poisoning, and improper implementation of agrotechnical measures. Soil erosion. Erosion (Latin yerozzo - to gnaw) is a Latin word meaning destruction. Soil erosion is the washing away of the fertile soil layer by water or wind.

There are two types of factors that cause soil erosion.

1. Wind erosion.
2. Water erosion.

In addition, erosion is divided into two types based on its rate of progression.

1. Natural, i.e., geological erosion is the destruction of soil particles under the influence of natural factors. This type of erosion occurs very slowly. Natural erosion cannot be prevented, but it causes almost no harm, because the soil lost in this process naturally recovers.

2. Artificial, i.e., anthropogenic erosion is a soil-destructive process that occurs under the influence of human economic activity. Such erosion is called accelerated erosion. Such rapid erosion is a catastrophe for the soil layer of the Earth's surface, which has destroyed 1 billion hectares of fertile soil over the past 100 years.



Currently, more than 3 thousand hectares of soils are subjected to soil erosion every day worldwide. The USA, Canada, South Africa, and Australia are particularly vulnerable to soil erosion. India, Pakistan, and Mediterranean countries are suffering greatly. Large-scale soil degradation forced the peoples of Ethiopia to relocate to new locations in 1984, 1985, and 1987. Soil erosion is especially strong in China, which ranks first in the world in this regard. In this country, 150 million hectares of land have been subjected to erosion. One of the main causes of artificial erosion is deforestation. For example, in Chile, when the area of forests constituted 60% of the country's territory, soil erosion did not occur. However, due to the subsequent reduction of forest areas to 25%, 72% of the land here is occupied eroded The importance of protective forest belts in protecting soil from erosion is especially noticeable in Central Asian countries. The Republic of Uzbekistan is the least forested region among the CIS countries. Forests make up 42.7% of the country's area in Russia, 34-38% in the Baltic republics and Georgia, and 9-11% in Armenia, Moldova, Turkmenistan, and Azerbaijan. In Uzbekistan, this figure is 3.2%. Since a large area of Uzbekistan (64%) is occupied by desert and semi-desert territories, its climate is dry and hot, with strong winds and dust storms, and in the summer heat, there are occasional hot winds. Such an unfavorable climate is felt in 80-85% of the territory of the republic. Due to the scarcity of forests and shelterbelts, they cannot block the path of winds and storms. Therefore, wind erosion poses a constant threat in irrigated areas in the western part of the republic. This risk is especially high in areas adjacent to the desert. According to experts, approximately 22 million tons of the fertile soil layer are subjected to erosion annually in the republic. 75% of mudflows occurring in Central Asia occur in the territory of Uzbekistan.

Therefore, water erosion poses a threat to the eastern region of the republic. Only on the mountain slopes, up to 525 tons of fertile soil per hectare are washed with water annually.



Two types of soil salinization are distinguished - primary and secondary salinization. Primary soil salinization occurs due to the influence of salts entering it with water and falling from the air. Such salinization can be partially reduced by filling the soil with water during the winter season and leaching the salts. However, secondary soil salinization is dangerous for agriculture. Secondary salinization arises from a rise in the groundwater level. During the evaporation (infiltration) of these waters, located close to the Earth's surface, their salts accumulate on the soil surface as infiltrants. Their removal is more complex and expensive, requiring horizontal (open ditches) or vertical (vertical wells) drainage. In areas with unfavorable relief, the removal of groundwater is a rather complex process. Therefore, in such areas, the melioration state of the soil deteriorates, and instead of sown areas, swampy areas appear. Swamping is especially noticeable in developed gypsum deserts, in the confluence of the Syr Darya and Amu Darya rivers. Desertification of soil. The decrease in land resources is caused by the desertification of fertile soils in some areas of arid regions. If we take into account that arid regions occupy about half (43%) of the total land area of the Earth's surface, then carelessness can lead to the loss of a very large amount of food. According to the data, 910 million hectares of "anthropogenic" deserts have been formed in the world as a result of human economic activity. In such deserts, biological processes are disrupted, ecosystems are disrupted,

and the natural and economic potential is sharply reduced. Soil contamination. The introduction of various pesticides (Lat. pestis - infectious disease, caedere - to erode) and chemical wastes into the soil poisons it and reduces its fertility. The widespread use of chemical poisons against harmful insects, on the one hand, destroys beneficial living organisms in the soil along with them, and on the other hand, poisons the soil and disrupts its natural ecosystem. Although the use of chemicals, including various pesticides, has become somewhat regulated in agriculture in recent years, until the recent past, the soil of Uzbekistan was considered the most highly toxic soil in the world. According to 1987 data, the amount of chemical poisons used in agriculture was 2-3 kg per hectare in the USA, while in Uzbekistan this amount was 54.4 kg. During the years of independence, the use of chemical poisons in our republic's agriculture has become somewhat regulated, and there has been a transition from chemical control methods to biological control methods in protecting skincare fields from harmful insects.. As a result, in 1990, the use of chemical poisons per hectare was reduced to 20.6 kg, and in 1993, to 13/g kg, and the place of chemical poisons was taken by beneficial insects, which are enemies of harmful insects. Currently, there are more than 300 biolaboratories in the republic, in which up to 10 tons of trichogramma, more than a billion gaborbracons and golden-eyes are bred per season. In 2007 alone, 13 biolaboratories were established. The impact of industrial emissions on soil contamination is significant. Land near chemical, oil refining, metallurgical, and cement plants is especially polluted. Toxic substances released into the atmosphere from enterprises settle in the soil and poison fertile lands. In the soil of such lands, toxic elements such as sulfuric acid, antimony, mercury, lead, and fluorine accumulate, hindering plant growth. In some areas, the chemical contamination of the soil around industrial enterprises leads to the extinction of living organisms in the ecosystem and the formation of an "industrial desert" in place of fertile orchards. Incorrect implementation of agrotechnical measures. Agrotechnical measures are comprehensive, including, in addition to work aimed at fertilizing the soil with organic and mineral fertilizers, leaching salts, and improving its melioration state, the introduction of crop rotation, plowing, and similar works. Introduction of monoculture. In agriculture, the replacement of crop rotation by monoculture disrupts the natural balance in the soil, leading to various diseases in the soils of crops harmful insects and weeds.

Conclusion

The main reasons for the decrease in soil fertility are its erosion, lack of nutrients, salinization, waterlogging, desertification, its poisoning, and improper implementation of agrotechnical measures. Soil erosion is the washing away of the fertile soil layer by water or wind. The implementation of measures to preserve and restore soil fertility contributes to the sustainable development of agriculture, ensuring food security, and environmental protection.

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