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ADVANTAGES OF DROP IRRIGATION IN THE PROCESS OF DEGREADATION IN THE ARAL SEA REGION

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ABSTRACT

The main thing that keeps a person food safe and fills his share is the soil. Inadvertent land use by people in the past has led to soil degradation and water scarcity, encouraging people to act wisely in the future. Depending on the circumstances, the time itself demands that we make effective use of scientific advances for the use of land and water resources.

KEYWORDS: ***Aral Sea, Karakalpakstan, saline soils, water scarcity, extreme climatic conditions, agriculture, water supply, drip irrigation, degradation, soil, economy;***

INTRODUCTION

While there are 4 billion hectares of arable land in the world, 1.6 billion hectares of this area are currently in active use. At a time when global climate change has intensified in recent years, protecting soil from degradation processes is one of the most pressing issues worldwide. The importance of this problem is that without eliminating the process of soil degradation and preserving the soil layer of the Earth, it is impossible to maintain neither the flora and fauna, nor the cleanliness of water and air. Therefore, it is impossible to maintain the ecological well-being of human life without maintaining the normal functioning of the biosphere.

Picture 1. N. B. Reyimov at work.

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MATERIALS AND METHODS

Recognizing the danger of soil degradation, pollution and general degradation, the first United Nations World Conference on the Environment in 1972 focused on the need to protect soil. The International Food Organization (IFO), meanwhile, adopted the World Soil Party in 1982, calling on governments of all countries to view the soil layer as a human resource.

As a result of the implementation of the international scientific project "Global Assessment of Soil Degradation", degradation processes have reached about 2 billion. hectares. Of these, 58.8% of the area of soil degradation, 29.2% of the area of wind erosion (degradation), 13.7% of the area of chemical degradation (salinity, pollution, nutrient depletion), 6.5% of the area of soil siltation are water. erosion share.

During the historical period, humanity has lost about 2 billion. The loss of fertile lands, the conversion of soils into barren lands and anthropogenic deserts can be added to the data indicating the global and diverse nature of the soil degradation process.

RESEARCH RESULTS

In particular, the condition of soils in the country is unsatisfactory. Agricultural lands in Uzbekistan are 24057.1 thousand hectares, which is 53.59% of the total land area of the Republic. The area of irrigated lands is 4214.3 thousand hectares, which is 9.39%.

These figures show that the main forms of soil degradation occur as a result of natural and climatic conditions and human activities, which are unique in different regions of the country. These include desertification, deforestation, secondary salinization, and unnecessary excess moisture during irrigation as a result of uneven soil;

water and irrigation erosion in mountainous and foothill areas, deflation, as well as pasture degradation in areas with intensive livestock development, man-made desertification as a result of agricultural and industrial land development, violation of the law of crop return and return of used nutrients to the soil (side return), siderate and degradation and water scarcity processes such as salinization of soils are observed as a result of systemic planting of intermediate crops, decrease and pollution of soil fertility as a result of planting the same crop, drying of the Aral Sea and settling of salt dust aerosols on the soil surface.

Due to the fact that the Republic of Karakalpakstan is located in the lower reaches of the Amudarya, the main water artery of Central Asia, the process of water scarcity is often felt here.

Picture 2. Plant and a drop of water

In recent years, water shortages in the Aral Sea region have recurred frequently, reaching 39-41% in 1999-2001, 50-55% in 2007-2010, and 54-58% in recent years, leaving the Aral Sea without water at all. According to world experts, water shortages will increase by 15-17% in the future, and years of drought are likely to recur. In this context, in the Republic of Karakalpakstan on the Aral Sea coast, it is important to address the issues of agricultural specialization, planting low-water crops instead of water-intensive crops, the use and improvement of water-saving technologies, planning the development of water-intensive livestock [3].

For efficient use of water resources in agriculture in the Aral Sea region in the conditions of water scarcity in production and as an experiment,

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land leveling with laser devices, underground irrigation, irrigation using portable flexible plastic pipes, film irrigation, drip irrigation, drip irrigation, sprinkler irrigation, subsoil irrigation and short-row irrigation methods are used and certain results are obtained from them.

Among these methods in Uzbekistan is the introduction of drip irrigation technology. During drip irrigation, the lands are leveled evenly and precisely at the same time. Optimal conditions are created in the area where the plant is located, evaporation is reduced, irrigation water is used efficiently up to 95-97%.

There was no interest in drip irrigation technology in Uzbekistan. The following results were obtained when the technology of drip irrigation of agricultural crops in the world was calculated as a percentage of the total land area.

When we compare the results of UNESCO data on the use of drip irrigation technology in some countries around the world, drip irrigation technology is used in Spain on 1910 thousand hectares, 5.1% of the total area, in India on 2,191 thousand hectares, 6.2% of the total area, in America 1680 thousand hectares, 7.4% of the total area, used in China on 5 285 thousand hectares, 9.8% of the total area, used in Arabia on 740 thousand hectares, 17.2% of the total area, used in Turkey on 347 thousand hectares, 17.3% of the total area and drip irrigation technology in Israel 142.6 thousand. Hectares are introduced in the area and make up 75% of the total area. In Uzbekistan, this figure was introduced in 2016 with a total area of 5668 hectares using drip irrigation technology, in 2017 - 9030, in 2018 - 15,103, in 2019 - 40,000, in 2021 - 44.8 thousand hectares, which is 1% of the total area. It is planned to increase it to 1,000,000 hectares by the year and further develop it in the future.

CONCLUSIONS

The advantages of drip irrigation in the context of degraded soil and water scarcity in Karakalpakstan are as follows;

1. In drip irrigation, the planted crop is irrigated, not the entire field.
2. In drip irrigation of row crops, water is clearly supplied to the plant root.
3. Drip irrigation saves 43-54% of water consumption for field irrigation.
4. Water reaches all parts of the field at the same time.
5. The entire area of the contour is evenly and saturated moisturized.
6. Quality irrigation can be carried out even in complex topographic conditions.
7. Drip irrigation can also be used in soils with different mechanical composition.
8. In all cold and freezing weather, even in strong winds, drip irrigation can be carried out without stopping.

However, the drip irrigation method also has its drawbacks, including;

1. In the drip irrigation method, additional time is required to install the irrigation hoses and other water-driven water pumps.
2. Additional funds are required for the purchase of drip irrigation equipment.
3. Drip irrigation requires high filtration.
4. In the drip irrigation method, there is a risk of freezing if the hose and other rapidly collecting equipment in the irrigation system are cold and the water is not collected before it is frozen.
5. If drip irrigation is not carried out regularly, there is a risk of salt accumulation in the wet area.

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