MEASURES TO FIGHT AGAINST DROUGHT IN AGRICULTURE

Yangibayev Merdan Yangibayev
Turkmen state pedagogical instituty named after Seyitnazar Seydi

Annotation: *Drought and dry winds have devastating consequences for agriculture. The paper describes droughts and dry winds and presents effective methods for combating them. The complexity of these phenomena and the need to study them on a scientific basis are emphasized. The use of green manures and hydrogels in agriculture is an effective strategy for combating drought, ensuring the resilience of crops under water scarity conditions. Green manures, such as clover, alfalfa and mustard, help improve soil structure, increase its water retention capacity, and contribute to the enrichment of organic matter content. They also help combat erosion and enhance soil biological activity. Hydrogels, on the other hand, actively used to retain water in the soil, improving its moisture-holding capacity, which significantly reduces the negative impact of drought of plants. The combined use of green manures and hydrogels creates optimal conditions for crop growth, increasing yield and resilience to extreme climatic conditions.*

Key words:*Drought, dry wind, agrotechnical measures, biotechnical measures, man-made measures, sustainable development, green manure.*

INTRODUCTION

According to scientific data, 85% of the Earth's dry land is subject to some degree of drought. Drought and hot wind have detrimental effects on agriculture. Scientists have conducted many observational studies to learn what drought and hot wind are, their frequency, and ways to fight them. Scientists working in various fields participated in the study of these phenomena. This means that the phenomena are very complex and they should be approached on a scientific basis.

Droughts are caused by prolonged periods of low precipitation and high levels of evapotranspiration. As a result, it dries out the soil in the spreading layer of the plant's roots and disrupts the plant's water supply. Because of this, plants improve their fertility. This is always the case in desert and semi-desert zones. Droughts do not occur every year in desert and forest-desert zones. If the soil does not receive enough moisture during the spring months when the snow melts, and if there is little rain in the spring and summer, drought can occur. In this case, the plants feel the lack of water even with a small amount of water. Such drought is called soil drought. Hot wind is a complex meteorological phenomenon characterized by very low air humidity (less than 30%), high temperatures (above 250C) and strong winds.

In agrometeorological science, he has shown moisture deficiency as a reliable predictor of wheat. It varies with the effect of wind speed.

The amount of iron in the soil is of great importance during maturity. If the soil layer in the spreading layer of the root is ripe, then the plants that are wasted during the day will come to their senses at night. There are 3 types of measures used to combat drought in agriculture:

- agricultural measures;
- biotechnical measures;
- man-made measures.

Planting cedars is considered one of the convenient and effective methods of biological measures.

Siderates are plants that are grown not for harvesting, but to improve soil quality. Siderates are real rescuers for the soil in arid conditions. They not only enrich the earth with nutrients, but also help it retain moisture. Due to the powerful root system and dense foliage, siderates create a kind of protective layer on the soil surface that prevents moisture evaporation. When choosing siderates for arid areas, it is worth paying attention to plants that:

- they are resistant to drought and have a deep root system that allows them to extract moisture from deep soil layers.
- they grow quickly, create a dense vegetation cover that prevents moisture evaporation.
- they tolerate heat well, they do not lose their decorative effect and productivity in hot weather.

For arid conditions, you can use:

- just a fast-growing plant that tolerates drought and heat well. Its roots penetrate deep into the soil, improving its structure.
- Buckwheat: It has a powerful root system, improves the soil structure and enriches it with nitrogen.
- Phacelia, grows quickly and creates a dense carpet that protects the soil from erosion.

If plants such as Lupine, Lucerne, and Donnik are planted, in areas with high and persistent low humidity, their roots penetrate into the lower layers of the soil and help to obtain sufficient moisture. When planting cedars, they should be planted between two rows, as these prevent water evaporation during planting and prevent soil damage.

Another way to protect agricultural crops from drought is to use hydrogels. Hydrogels are substances that retain moisture in the soil and help the soil use water more efficiently. On the one hand, hydrogels retain moisture in the soil, and on the other hand, they create favorable conditions for seed growth.

The benefits of using hydrogels include:

- reduces the frequency of irrigation. This saves labor and water;
- improves seed germination and keeps it constantly moist;
- contributes to the stabilization of soil moisture;
- increases the resistance of plants to drought and moisture;

- the quality of plants grown with the help of hydrogel is higher than plants grown without hydrogel.

The Economic Advantages of Using Hydrogels in Agriculture

Cost-Benefit Analysis of Hydrogels.

Initial Investment.

Cost of Hydrogels: Initial expenses include purchasing and applying hydrogels. Hydrogels might seem costly upfront but offer significant savings in the long run compared to traditional methods.

Long-Term Economic Benefits.

Reduced Irrigation Costs: By retaining water, hydrogels significantly reduce the need for frequent irrigation, leading to substantial savings on water bills.

Fertiliser Efficiency: Hydrogels enhance nutrient uptake, reducing the amount of fertiliser needed and cutting costs.

Labour Reduction: Less frequent irrigation and maintenance reduce labour costs, freeing up resources for other farming activities.

Yield Improvement.

Higher Crop Yields: Enhanced water and nutrient availability lead to increased crop production, directly impacting profitability.

Quality of Produce: Consistent moisture and nutrient levels improve the quality of crops, leading to higher market prices.

Environmental and Economic Synergy.

Sustainability and Profitability.

Eco-Friendly: GelPonics hydrogels are biodegradable, reducing environmental impact and promoting sustainable farming practices.

Market Advantage: Farmers using eco-friendly practices can command premium prices and differentiate themselves in the market.

The practical implementation of the above recommendations will have a positive effect on the prevention of hydrometeorological phenomenon of drought and drought on the agricultural sector and on the sustainable development of the regions.

The use of green manures and hydrogels in agriculture is a promising and effective approach to combat drought. Green manures help improve soil structure, increase its water retention capacity, and enhance organic matter content, which overall contributes to the resilience of crops under unfavorable climatic conditions. Hydrogels, on the other hand, help retain moisture in the soil, preventing it from drying out and providing plants with the necessary water during drought periods. The combined use of these technologies significantly increases yield, reduces risks associated with climate change, and enhances the ecological sustainability of agriculture. Therefore, the use of green manures and hydrogels is an important step towards sustainable agriculture in the face of climate change.

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