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Application of resource-efficient irrigation technologies in desert pastures of Bukhara region

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Annotation: Part of the fertilizers applied to the soil during the irrigation process, the toxic chemicals used against weeds and insects are leached into the underground waters, causing their ecological and meliorational condition to deteriorate. The above-mentioned reasons require the effective use of water reserves allocated to irrigated lands, the system of agro-technological measures that do not adversely affect the ecological situation, the scientific justification and implementation of irrigation methods and procedures.

Key words: egat, pasture, melioration, irrigation method, technology, hectare, area, drop, chemical, toxic.

It was organized on the basis of the decision on the measures for more intensive organization of the introduction of water-saving technologies in agriculture. In the last two years, special attention was paid to the introduction of water-saving technologies in the cultivation of agricultural crops.
As a result of state support, in 2020, water-saving technologies were introduced on an additional 133,000 hectares.
In order to increase the effectiveness of the mechanisms for promoting the introduction of water-saving technologies in agriculture, and to achieve a stable supply of water to irrigated areas:
On measures to improve the efficiency of agricultural land use in the Bukhara region. 77.8 thousand hectares) in order to put the land back into use and to use the existing land and water resources effectively, the Cabinet of Ministers decides:
Part of the fertilizers applied to the soil during the irrigation process, the toxic chemicals used against weeds and insects are leached into the underground waters, which leads to the deterioration of their ecological and meliorative condition. The above-mentioned reasons require the effective use of water reserves allocated to irrigated lands, the system of agro-technological measures that do not adversely affect the ecological situation, the scientific justification and implementation of irrigation methods and procedures.

Alleviation of water shortage in the northern region of our republic and rational use of water reserves, the system of agro-technological measures at the level of today's requirements, the method of drip irrigation that does not negatively affect the ecological situation, and the fact that the methods of watering crops in this method have not been studied are the basis of the choice of this topic.

A new system of using water and irrigation networks was created in our country, the law "On water and water use" was implemented, and "water consumers' associations" were established in farmers' and peasant farms. But until now, mostly outdated techniques and technologies are being used for irrigation of agricultural crops. In particular, irrigation of all agricultural crops, salt washing, irrigation to create a moisture reserve in the soil is carried out by the methods of overhead or pressure irrigation. Also, the technology of growing all crops is inextricably linked with these irrigation methods.

For example, taking egates for irrigation in Pavlovian care technology, placing shoots and opening them before watering, burying after watering, several times processing between rows, mineral fertilizers egate Agrotechnical activities such as dredging, manual weed control are performed in connection with irrigation. When watering crops by tilting them over the ground, many operations are performed manually, most importantly, the water needed for agricultural crops is consumed much more (25-30%) than the required norm in this method. As a result of the improper distribution of water to the soil, the mineral fertilizers placed at the bottom of the soil are washed with water or absorbed into the lower layers, and their effectiveness decreases, excessive irrigation has a negative effect on the soil melioration and ecological condition, and the work of the collector and drainage networks. has an effect. In the developed countries of the world, the most modern economical, computerized drip irrigation method has been widely used for irrigation of agricultural crops for many years.

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The advantages of the drip irrigation method compared to other techniques and technologies have been studied to a certain extent by foreign and Uzbek scientists and specialists in this field.

According to the results of scientific research carried out so far, drip irrigation can save up to 40-55% of water, reduce labor costs by 1.5-2 times, reduce labor costs by 35-40% compared to drip irrigation on 1 hectare of land. saving of mineral fertilizers, increase of cotton yield by 8-10 s/ha was determined.

The uniqueness of the drip irrigation system is determined by the fact that it consists of a continuous water distribution network working under pressure. This network continuously and regularly supplies water to the root layer of crops equal to the plant's need for water.

Water savings in drip irrigation are usually achieved by:

- the specificity of the watering regime (the conformity of the watering rate with the water demand of the plant);
- limitation of the irrigated (moistened) area (water is supplied directly to the layer where the root of the plant develops);
- low amount of water evaporating from the soil (because most of the field remains dry);
- limiting the development of weeds (due to the absence of these weeds, all the water is used by crops);
- that the water used for irrigation does not spread across the field and does not soak into the soil;
- not to throw water from the field into the field.

In drip irrigation, the efficiency of irrigation is equal to 90-95% due to the fact that only the root area of the plant is moistened. This indicator does not exceed 70-75% in the irrigation and sprinkler irrigation methods.

In recent years, research work on the creation of techniques and technologies of drip irrigation and their scientific study is being carried out in Uzbekistan. Drip irrigation techniques brought to our country for study were mainly bought from foreign countries (Israel, Turkey, Germany, etc.) at the expense of huge funds. In addition, many elements of drip irrigation techniques are not suitable for our different climatic soil and land reclamation conditions.

The object of conducting scientific research - Scientific research was carried out in the irrigated lands of "Plantation Service Union" LLC in the Qarovulbazar district of the Bukhara region.

The purpose of research. The goal is to create a low-cost and high-quality wood growing technology from paulownia tree, saving water using drip irrigation technique.

Research tasks: To achieve this goal, the following tasks were planned:

1 Studying the elements of the drip irrigation technique and adapting some elements to each climate-soil, hydrogeological, land reclamation conditions and types of crops.

2 To develop the technology of cultivation under the conditions of the newly created drip irrigation technique and to determine its advantages and efficiency by comparing these crops with the cultivation technology under the conditions of drip irrigation.

3. Determination of moderate watering procedure (number, duration and rate of watering) for paulownia with drip irrigation method;

4 To determine the impact of the studied techniques and technologies on the growth, development, productivity of paulownia;

Based on the results of research, preparation of recommendations for production on the basis of paulownia drip irrigation technology and introduction to production through innovation.

Drip Irrigation: In alleviating the increasing water scarcity, the economical use of water resources is important. The optimal water-saving method of irrigation in irrigated agriculture is drip irrigation.

Technical indicators. A flexible polyethylene pipe with a dropper, which is the main part of the drip irrigation system, has the following technical characteristics.

1. The diameter of the flexible polyethylene pipe, mm – 16.
2. Type of droppers - labyrinth - slotted.

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3. Water consumption of each dropper (in relation to pressure), l/hour – 1 – 5.
4. The distance between the droppers, cm - 300 is different according to the order.
5. Drip unevenness along the length of the flexible pipe, %:
• 10 in 500 meters;
• 15 in 1000 meters.
6. Water pressure required for system operation, m. water column - 20-30
7. The length of the irrigable edge (m), relative to the slope:
• at i = 0.001 - 250;
• at i = 0.003 - 500;
• at i = 0.006 - 1000;.

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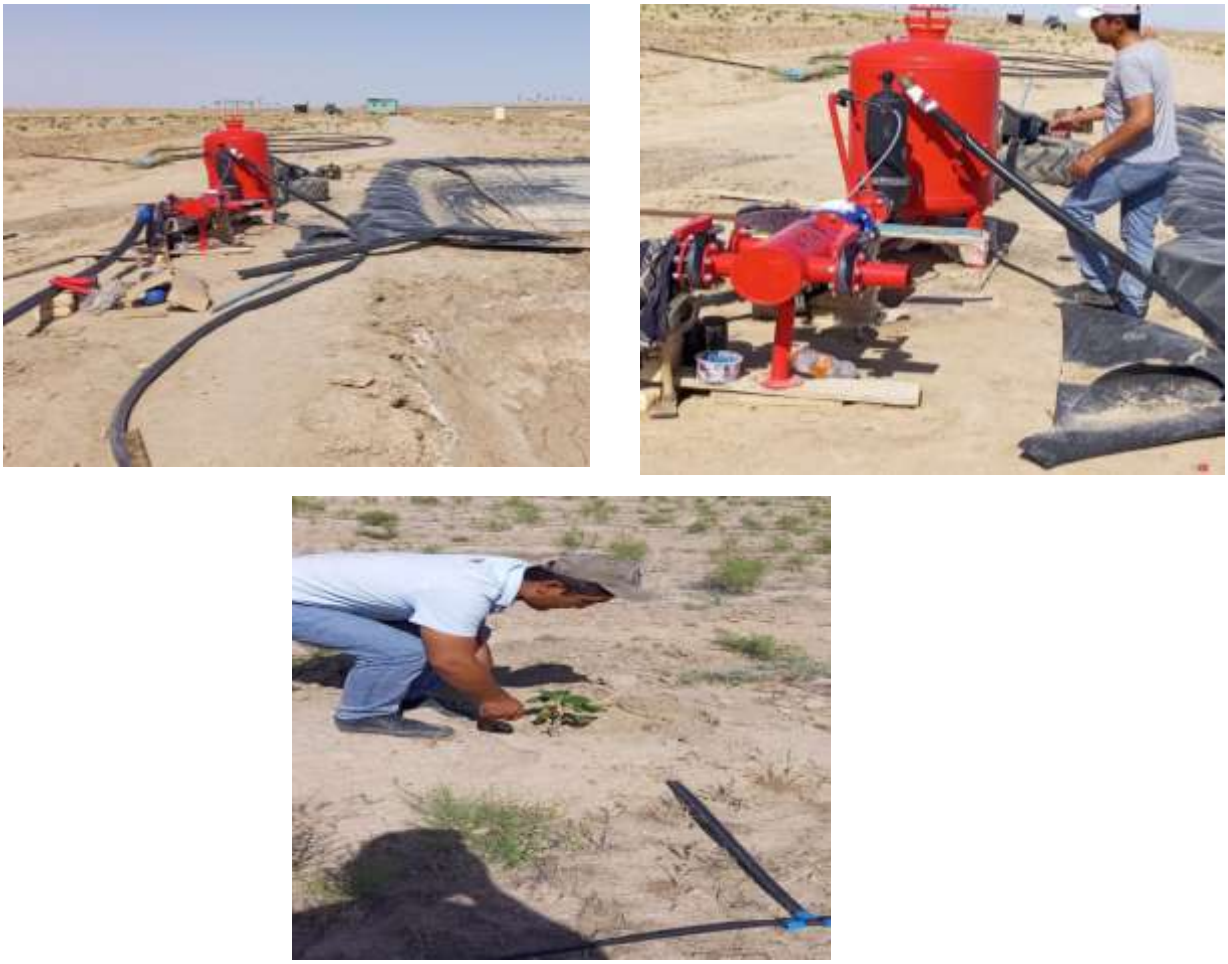

Figure 1.1. Drip irrigation system.

Requirements for the turbidity of water used for drip irrigation:
• clear water;
9. Service life of a flexible polyethylene pipe, 3-4 years.
10. The underground system of the pipeline and the period of operation of the quencher, year-15-20.
11. Consumption of a drip pipe for one hectare of land, pog.m.:
• in gardens - when there is 5 meters between seedlings - 2000;
• in gardens - when there is 8 meters between seedlings - 1250;
• in vineyards - when there is 5 meters between seedlings - 3400;
• in vegetables - 5600;
• on a loan - 3000;

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Table 1.1. Technical characteristics of a flexible polyethylene pipe with a dropper

O.n.	Characteristics	Measure unit	Amount
1	Diameter	mm	16
2	Type of droppers	labyrinth-slotted	
3	Water consumption per dropper (vs. pressure)	l/s	1-3
4	Distance between droppers	sm	300, different
5	• Drip unevenness: • 500 in meters; • 1000 in meters	 % %	 10 15
6	The water column necessary for the operation of the system	m.	20-30
7	Optimal egate length	m	300
8	Optimal slope of the field		0,003- 0,006.
9	Period of operation	Year	3
10	Life cycle of main plastic pipes	Year	12 - 15
11	of a dripper pipe per hectare price (until 01.01.2022): • • when the space between pavlonia seedlings is 3 meters and the area is 100 ha.	thousand soums	20000,0

When choosing irrigation methods and techniques, biological factors such as crop irrigation regime, plant development characteristics, and cultivation technology are also taken into account. The height (height) of the cultivated crop should be taken into account when choosing the type of sprinkler irrigation machines. Also, sprinkler irrigation is more effective than other irrigation methods when watering plants whose root system is located in the upper layers of the soil (for example, vegetable crops) [15, 19].

Irrigation methods and techniques are determined by economic conditions such as the location and specialization of the farm, the size and shape of the fields, the type of crop rotation, the organization of the irrigated area, and the level of water supply of the irrigation system. , water and land use coefficients, useful work coefficient of the system, water quality, temperature, salinity level, and water management conditions such as the location of the water source should also be taken into account. The possibility of using suitable irrigation methods and techniques is determined by comparing their technical and economic indicators [21]. The climatic conditions of the regions where crops are grown are poorly controlled and it is the main factor that determines the amount of crop irrigation. Thus, the selection and application of the optimal irrigation regime, taking into account the climate, soil-hydrogeological conditions of the place where cotton is grown, the meliorative state of the soil, and the establishment of technically perfect hydromelioration systems that allow mechanized and automated distribution of water in agriculture in order to improve the efficiency of land reclamation, to reconstruct and equip the existing systems, to implement new organizational methods in their technical service, to reduce waste of water, to improve irrigation techniques, to apply the crop irrigation regime in a stratified manner, to care for crops application of intensive technologies is a guarantee of abundant and high-quality harvest. In the last 5-6 years, the interest in Pavlovnia has been increasing tremendously in our country. Pavlovnia is distinguished not only by the fastest growth of the trees on the Earth, but also by the fact that it blooms with fantastic beauty, it is valued as a source of valuable wood, honey, and biomass, it decorates parks and avenues as an ornamental tree. Of course, since Pavlovnia is a new plant in our country, many questions arise. We have selected the most common and very important questions, and with these questions Alisher Toraev, a scientist, doctor of biological sciences, professor, who was one of the first in Uzbekistan to introduce the cultivation of paulownia in the soil of our country. Pavlovnia is an undemanding tree that loves water, so it can be grown almost anywhere there is water. pN grows in various soils in a wide range of environments. The limiting factors in growing this tree are its rapid growth, large size, and extremely strong roots.

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Therefore, I do not recommend planting Pavlovnia in the following places:

• in the garden area of the house;

• near the foundation or house.

In a word, I would say that Pavlovnia is not a good choice for decorating private houses that are not larger than 0.06 hectares (6 acres). Although the root itself is straight, it can grow horizontally, and these slabs can damage foundations and sidewalks, causing significant damage.

Poplar and pavlovnia; comparing these two trees is completely wrong, Pavlovnia wood is much more expensive than poplar wood. Pavlovnia wood can be used to make almost anything from furniture to musical instruments, Poplar wood is of low quality and is used for roofing support or wooden boxes. Pavlovnia wood is twice as expensive as pine wood on the world market - 1 m3 is valued up to $800. A simple calculation shows that the net income in 7 years will be 980,000,000 soums or $120,000. Thus, the cultivation of Pavlovnia is much more profitable than the cultivation of poplars.

Determining the duration of irrigation in the method of S.N. Rizhov is based not on absolute moisture, which is different in different soils, but on soil moisture expressed as a percentage of the minimum water capacity.

According to M.H. Hamidov's experiments, the soil moisture before irrigation is 70-80- At 60%, the most favorable conditions occur. Such soil moisture regime is nutrient irrigation and 4 irrigations according to the 1-3-0 scheme, irrigation rates of 700-900 m3/ha and seasonal irrigation rate of 4200 m3/ha (nutrient taking into account irrigation) is brought about through. With this irrigation regime, it is possible to get a cotton yield of up to 45 s/ha.

This Chapter I is entitled "Literature Review in Drip Irrigation System". In this Chapter I, the conditions and characteristics of using the drip irrigation system of paulownia, the establishment of plantations, the supply of raw materials in the drip irrigation of paulownia, the main purpose of drip irrigation, its development and the mode of feeding the fields were considered.

The soil water regime created by irrigation depends on natural economic conditions and plant type. Soil water depends on its physical properties, hydrogeological conditions, etc.

It is necessary to introduce the technology of drip irrigation of paulownia seedlings more widely.

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