ONE OF THE MOST EFFECTIVE WATER-SAVING TECHNOLOGIES IS SPRINKLER IRRIGATION

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Abstract: In recent years, special attention has been paid to increasing the efficiency of agricultural land in our country, including using water-saving technologies. However, shortcomings in the production, supply, procurement, on-site design and installation of water-saving irrigation systems, as well as the lack of skills of some agricultural producers in this regard, are the reasons for the late introduction of these technologies. is happening

Decision PQ-144 dated 01.03.2022 on measures to further improve the introduction of water-saving technologies in agriculture.

Key words: *Pumping station, water source, water intake facility, water pipes, water softener and vane camera water sprinklers .*

In the last five years, special attention has been paid to the introduction of water-saving technologies in the cultivation of agricultural crops. As a result of state support, in 2020 alone, water-saving technologies were introduced on an additional 133,000 hectares. However, increasing water scarcity and increasing demand for water resources require a drastic increase in the efficiency of water use in agriculture.

Increasing the effectiveness of mechanisms for encouraging the introduction of water-saving technologies in agriculture, achieving a stable supply of water to irrigated areas

Fivefold increase in the rate of introduction of drip and rain irrigation systems and discrete irrigation method with laser leveling of the land in the cultivation of agricultural crops by the Ministry of Water Economy, the Council of Ministers of the Republic of Karakalpakstan and regional governments ,

Sprinkler irrigation means to crush the irrigation water using special technical devices, turn it into small water drops and transfer it from the surface layer to plants and soil in the form of artificial rain. Advantages of sprinkler irrigation:

changing the depth of soil salinization through the rate of irrigation.

increasing the relative humidity of the surface layer of the air and lowering its temperature, ensuring that crops are not hit by cold;

equal distribution of water across the field and no requirement for its relief;

no need to build irrigation ditches and ditches;

the possibility of giving mineral fertilizers with irrigation water;

adaptability to irrigation;

water-saving method, high water utilization coefficient;

High land use ratio. Elements of sprinkler irrigation technique:

irrigation intensity;

raindrop size;

even distribution of rain over the area. The correctness of the elements of the sprinkler irrigation technique is determined by the provision of a favorable water regime of the soil, the non-destruction of the soil structure, the non-damage of the plant, the non-accumulation of water on the soil, and the non-occurrence of water flow. Rainfall rate is the amount of rain that falls on the irrigated surface in one minute (mm/min) or the thickness of the water layer formed by artificial rain in a unit of time .

The following terms and units are used in the application of sprinkler irrigation technology: Water pressure: pressure at the bottom of the water column; unit – m, water pressure at the bottom of a water column 10 m high is 10 m = 1 atm. (about 1 bar). Water volume: volume is measured in units. In the metric system, the units are liters (l) and cubic meters (m3), (1000 l = 1 m3). Water consumption (delivery): the volume of water transported through a certain section during a unit of time. Metric unit: m3/s or l/s. Wetting circle

diameter: the diameter of the circle on the soil surface where wetting is carried out using a special sprayer. The diameter is twice the radius of the nozzle. The unit of measurement is meter (m). Sprinkler spacing (pitch): the number of sprinklers (sprinkler vanes) along the length of the pipes and the distance between them. Example: 12 mx 18 m. Rainfall rate: the force with which water droplets fall on the soil during sprinkling. Velocity depends on the number of drops, their size, speed and the angle of impact of the raindrop when it falls on the soil surface. Speed is expressed in the following indicators: high, medium, low. Irrigation consumption (irrigation rate): amount of water delivered per unit area per unit of time: per hour per hectare (ha) 1 mm/h = 1 m3 . Irrigation period: the time interval between two irrigation cycles, that is, between the start of one irrigation cycle and the start of the next cycle. Irrigation cycle time: the time from the beginning to the end of one irrigation in a given area. Wind speed: the unit of speed is meters divided by seconds (m/s). Nominal pipe diameter: pipe diameter (steel or asbestos-cement) up to 10" inside diameter, inches (1 inch = 25.4 mm). For larger pipe diameters, as well as aluminum and plastic pipes, the outside diameter is Specified: In inches – for aluminum tubing and in millimeters for plastic tubing Base: The connection has an internal or external thread, ranging from 0.5"-3" (12.7-76.2 mm) in diameter. Tube: is inserted into the base and connected to the sprayer body. Between the base and the tube, there are 1-3 spacers that act as bearings, which ensure the smooth rotation of the sprayer and reduce the frictional wear between the tube and the base. Sand Prevention Mechanism: Sand and gravel external includes a compression spring and outer plastic sleeve to prevent intrusion.Housing: serves to mount the housing parts that house the triplets as well as the moving parts of the spray arm.

Spring: Helps turn the sprayer, return the lever controlled by the water flow from the nozzle. Sprinkler irrigation is a highly mechanized method of irrigation. Sprinkler irrigation is carried out using special engineering devices.

Sprinkler irrigation is a method of irrigating agricultural crops that delivers water as much as possible to the surface of the soil and plants in a sprinkling manner that simulates natural irrigation, in particular: Comprehensive sprinkler irrigation system - a sprinkler irrigation system that delivers water in a circular or frontal motion using self-propelled units covering a large area. Sprinkler system - there are types of sprinkler irrigation systems that deliver water through small particles to the upper layer of the plant with the help of stationary short sprinkler equipment. The sprinkler irrigation method should be used primarily in flat and low-slope irrigation areas, in strong and highly permeable soils, in the irrigation of technical and spiky crops, grass crops and meadows, and gardens. is recommended. The main condition for using the sprinkler irrigation method is Pm<Vm, that is, the value of the artificial rain rate (Pm) must always be smaller than the soil water absorption rate (mv). If this condition is not met, artificial rain intensity in the top layer of the soil is understood as the thickness of the water layer formed by artificial rain within a unit of time. The biological effect of rain on agricultural crops is divided into simple, pulsed (continuous) and low (submerged) forms, depending on the duration and nature of soil moistening. In pulsed (continuous) sprinkler irrigation, artificial rain is delivered to the irrigation field in order to maintain daily air moisture and moisten the soil. Impulse sprinkler irrigation devices work in certain cycles. The first of these cycles is the water collection cycle (40-100 seconds) and the second is the sprinkler cycle (1-3 seconds). Mechanical composition: rain rate for heavy soils irrigation is 0.06-0.15 mm/min, medium soils 0.10-0.25 mm/min, light soils 0.15-0.45 mm/min should not exceed min. The optimal speed of artificial rain should be 0.06-0.15 mm/min, and the size of the raindrop should be d = (1-2) mm. , soil washing (erosion) occurs.

According to the results of the field experiments carried out within the framework of the research, an increase in the moisture content of the upper (0-20 cm) layers of the soil is observed during rain irrigation. As a result of regular

irrigation, the moisture content of the lower layers of the soil (20-60 cm) is significantly increased. From this it can be concluded that during rain irrigation, the lower layers of the soil, which are not necessary for the development of the crop (in this case, winter wheat), do not get wet, that is, there is no opportunity for water to be wasted. As a result, 40% less water is used to irrigate 1 hectare of the crop field during sprinkler irrigation than in conventional irrigation. According to the results of the research conducted on winter wheat rain irrigation, the number of winter wheat seedlings in the field irrigated by rain is almost 50% more than in the field irrigated by rain.

When sprinkler irrigation is used, the irrigation process is fully mechanized and the water is evenly distributed. It gives good results especially in the lands near the seepage waters and increases labor productivity by 3-4 times. The method of sprinkler irrigation makes it possible to use water efficiently, and the cotton yield increases by 3-4 t/ha. Irrigation water is saved by 35-45%.

Conclusion

1. It is known that water saving can be achieved if water-saving technologies are introduced step by step.

2. Productivity increases significantly in areas where water-saving technologies are installed.

Reference

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