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TECHNOLOGY AND TECHNICAL TOOL USED FOR THE EFFICIENT USE OF WATER RESOURCES

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Abstract

One of the most important issues of today is the efficient use of water resources, the development and up-to-date development of irrigation water-conservation technologies and techniques. This article focuses on the development of technology and technical tools for improving irrigation methods, the direct use of the proposed technology and the design technique in each field, and the analysis of the results.

Key words: density, root spread layer, area, moisture, slope, irrigation, irrigation water, technology, technical equipment, distribution, furrow, furrow opener.

Introduction. The present day, devoted to the development and implementation of scientifically grounded irrigation systems for agricultural crops and their optimal use at cropland, is one of the key issues of sustainable economic development in the world, especially in the country. Approved by the Decree of the President of the Republic of Uzbekistan dated February 7, 2017, No. P-4947, Amendment of the reclamation of irrigated lands in the "Strategy of Action for the five priority areas of development of the Republic of Uzbekistan in 2017-2021" and the Resolution of the Government of the Republic of Uzbekistan "On the State Program of Irrigation and Irrigation of Irrigated Lands for 2018-2019" dated November 27, 2017, improvement of the network of land reclamation and irrigation, the introduction of modern approaches to the agricultural production, first of all, water-saving technologies. Special attention has been paid to the widespread introduction of technologies, and this research has some relevance to the objectives set out in the regulations [1,2].

Sustainable use of water resources depends, first of all, on the level of preparedness of the surface area, which is especially evident in arable lands [3].

Materials and methods. Our research requires focusing on the plane of the bottom of the furrow, rather than the leveling of the arable land. The aim of the research work is to correct the moisture quality in the field by its length and depth, rather than by performing large-scale and costly land works on land leveling. The focus should be on flattening the furrow length and depth of the field due to the variable density of the furrow longitudinal profile, rather than focusing on large-scale land works. This will be achieved through automation of the process of changing the fencing of the furrow and the equipment of meliorative and agricultural machinery, participating in agro-reclamation activities [4].

Experience in ("Ergash Ruzimov", "Ishchanov Odilbek" farms) and Gurlan districts ("Madaminov Uktam" farm) and Beruniy district of the Republic of Karakalpakstan ("Reiimboy boss " farm) in the Shovot district of Khorezm selected as fields. The collector-drainage networks are built on these farms, irrigation systems are of engineering nature, and water for irrigation of crops is delivered to the fields through horns and axes, and crops are irrigated. The soils of these farms are weak and moderately saline [7].

The piloting and implementation of the proposed technology and the created technique were based on the following experimental system (Table 1).

This technology (8) has achieved the economic efficiency of irrigated water harvesting and the steady growth of crop yields on furrowed irrigated with the use of automated control system equipment.

Table 1

Field Experience Implementation System

№	Pre-irrigated soil moisture, % against ChDNS	The rate of irrigation, m^3 / ha
1	Observation of produce	Real measures
2	70-70-60	70-100-70 sm layers moisture deficiency.
3	70-80-60	70-100-70 sm layers moisture deficiency
4	70-80-60	70-100-70 sm layers moisture deficiency

The technical equipment that was created belongs to agricultural machinery, particularly tools for the cultivation of irrigated agricultural crops, [9] according to the source irrigation method, the purpose of the invention is to create uneven grounding at ground level by changing the length of the furrow to its maximum at the beginning of the furrow and at the end of the furrow to the minimum.

As prototype for this device, a cotton cultivator for furrow cutter is selected, which consists of a cultivator with a fuselage mounted fuselage. The cultivator cuts the furrow against the prepared surface of the field , so that the length profile of the furrow and its slope are usually formed as required by the unimpeded and rhythmic flow of irrigated water , but irrigation does not provide the soil thickness of the root surface and the flat soil moisture along the length of the furrow. At the beginning of the furrow, the water will have the maximum moisture content at the bottom of the furrow and the minimum at the end of the furrow. It possible to adjust the soil moisture at its maximum value, but this is achieved by significant moisture losses due to the wasteful costs of irrigation water and irrigation time. Therefore, the aim of the research technique is to develop a device for uneven grounding of the soil along the entire length of the furrow by gradually adjusting the depth of the bottom of the furrow from its maximum to the minimum at the end of the furrow.

The issue is as follows: a fuselage cultivator with a fuselage mounted grille with III-simulated seal frame attached to the hydraulic system of the base tractor, with reinforcing cages at the bottom of the frame [10].

The essence of the proposed work is that in a single device there are several tightening hinges that are hinged on the cultivator's furrow shot (grille), which are simultaneously controlled by one hydro cylinder and allow uneven compression of the bottom of the furrow (photo 1). The proposed device consists of 2 fitted shotguns (grille) (1). In the furrow shotgun (grille) (1) frame is mounted with 3 hardening

*Atazhanov A.U. New technology and technical means of creating a sustainable profile and design slope of irrigation furrows. Monograph. Printing house TIIAME. 2019 126 p. 6 hydraulic cylinders, with 1 hinge on the fuselage. The hydro cylinder 6 is connected to the transmission pipes 7 with the hydraulic system of the base tractor.

The device works as follows: the aggregator is set at the start position of the furrow and with the help of hydro cylinder 6, the compression cathodes are lowered to the surface of the furrow, with the hydraulic cylinder being pressed to a maximum pressure of 4 on the tightening rolls. A tracer is moved by the tractor`s hydraulic separator, by transferring fluid A to the stock cavity of the hydro cylinder. When the cultivator moves, the working fluid in the hydraulic cylinder slowly raises the frame 3, while 4 pressure reduction of the ground –rolling rollers occurs, resulting in a gradual change in pressure from the maximum value of the ground depth at the end of the furrow. At the end of the aggregate, the hydraulic separator is placed in a neutral position and the vehicle is moved to the vehicle using the suspension mounting system, and then the aggregate is turned to the rear. The cultivator is set to the reversible position. The base tractor is moved to the opposite of the starting position of the hydraulic separator in order to transfer the fluid to the 6 B cavity of the hydraulic cylinder. At the beginning of the reverse movement of the aggregate, fluid B enters into cavity B and compression drops to the bottom of the furrow until it is free of charge, then the unit is removed. The fluid entering cavity B gradually presses the compression cathodes, creating a density from 4 minimum values per furrow. In this way, a minimum density is created at the beginning and maximum at the end. With the frame raised, the unit rotates and the process is repeated [11].

The use of the proposed device will allow the entire section of the bottom of the furrow to be rigidly sealed, starting with the maximum value at the beginning of the furrow and ending with the zero at the end of the furrow.

Results. The following observations and researches were carried out in the selected cotton experimental field:

1. Before planting seeds to study the soil conditions of the experimental field, a complete soil section was dug to the depth of the groundwater, sampled soil samples from genetic sections of the section and in laboratory conditions its mechanical composition, humus, nitrogen, phosphorus and potassium, and salts in soil;

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2. Volumetric weight of the soil of the experimental field was determined annually using a roll of 10 cm height on the 0-100 cm layer at the beginning and end of the growing season;

3. The soil permeability of the experimental field

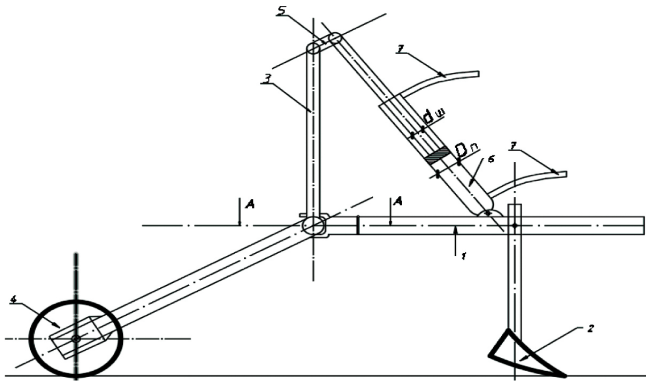

Figure 1. Irrigation fill bottom compensation equipment

was determined by a cylindrical circle based on the Nesterov method at the beginning and end of the vegetation year;

4. Field moisture content of the experimental field was determined from 10 to 10 cm depth by filling in a volume of 2000-3000 m^3 in a 2x2 m area before the start of field experiments;

5. Experimental wells were installed in the third variant of the second rotation and control field to study the depth and mineralization level of the groundwater level. Each time before and after irrigation, groundwater samples are taken from observation wells with special equipment and in laboratory conditions the amount of salts contained in it has been measured using a capacitor. The depth of ground water in the monitoring wells was measured every 10 days;

6. Changes in the experimental field moisture content were detected at the beginning and end of the vegetation in a digital laboratory measuring device at the depth of 0-100 cm before and after irrigation (3 days);

7. Consumption in the pilot area was measured using "Chippoletti "(0.50m) water meter and calculated by computation according to the schedule;

8. Conduct meter measuring 0–100 cm of soil at the beginning and end of the vegetation period at each and every 10–10 cm for all soil samples to determine the salinity of the experimental field soil;

9. Growth and development of cotton grown in the experimental fields was carried out in accordance with the methodology adopted by the Scientific-Research Institute of Agro technologies of Crop Breeding and Seed Production:

- The thickness of cotton is determined after the uniform and at the end of the growing season; Calculated the height and number of true leaves of cotton as of June 1;

July 1- calculated the height, number and flower of the horns;

Calculated the height of cotton, the number of branches and shoots for August 1;

Calculated the height of cotton, the number of bushes and the number of opened bushes as of September 1;

- the weight of cotton in cotton and the yield of cotton was calculated by the number of variations in the yield and variance of the yield [12].

Conclusion. Technology that allows the surface area to vary in intensity even when roughly flattened on the surface and bottom of the fence, and its automated workflow machine (Figure 1), allows accurate fitting of the longitudinal cross section. The uneven compression of the soil beneath the furrow is achieved by eliminating uneven moistening of the root-stratified soil layer by means of maximum and minimum pressure at the beginning of the furrow. Fields prepared by this technology can be used in the early years of development. The technology used will help to reduce irrigated water rates during the development of agricultural crops on the irrigated arable land with the use of automated control systems, and ensure the smooth and effective growth of crops.

Field practical work on number KX-A-QX-2018-529 "Creation of new technology and technical equipment to provide stable profile and projection slope of fracture cross section for efficient use of water resources" in Shovot and Gurlan districts of Khorezm region - our research confirms these issues [12].

The technology that provides longitudinal cross-sectional images along the sides and bottoms of the furrow, even with rough surface leveling, and the automated (laser) work piece machine that provides the precise image of the longitudinal shearing image. Uneven spraying of soil beneath the bottom of the furrow, which is achieved by maximal and minimum at the end of the furrow, eliminates uneven moistening of the root-stratified soil layer. Fields prepared by this technology can be used in the early years of development. The technology of this technology is achieved through the use of automated control system techniques to reduce the amount of water provided during the growing season on furrow irrigated fields and the high yield of plants [17].

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