USE OF RESOURCE-EFFICIENT IRRIGATION TECHNOLOGY IN THE REPUBLIC OF UZBEKISTAN

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Abstract. *The article presents the results of studies devoted to water-saving irrigation technology on steep slopes and clarifies the elements of irrigation technology for contour irrigation in the conditions of southern Uzbekistan.*

Keywords: *water conservation, furrow irrigation,water distribution, microburrows, contour irrigation, steep slope, polymer K-9, irrigation technique, irrigation technology, the greatest slope.*

ИСПОЛЬЗОВАНИЕ РЕСУРСОСБЕРЕГАЮЩИХ ТЕХНОЛОГИЙ ОРОШЕНИЯ В РЕСПУБЛИКЕ УЗБЕКИСТАН.

Аннотация. *В статье представлены результаты исследований, посвященных водосберегающей технологии полива на крутых склонах и уточнены элементы технологии полива при контурном поливе в условиях юга Узбекистана.*

Ключевые слова: *водосбережение, бороздковый полив, водораспределение, микроборозды, контурный полив, крутой уклон, полимер К-9, техника полива, технология полива, наибольший уклон.*

INTRODUCTION

As you know, the water conservation system includes a wide range of issues: optimization of reclamation regimes against the background of drainage and irrigation techniques, agrotechnical techniques that increase fertility, etc. That is, they are mainly reduced to managing the main elements of the water balance of the field: evaporation, filtration, unproductive discharge of water from the field, reducing the time of water supply from the irrigation network, excluding erosion and subsidence of soils, etc.

The well-known range of water-saving technologies used includes drip irrigation, frontal sprinkling, laser field planning, etc. They are covered in the works of a number of authors

MATERIALS AND METHODS

Certain studies are devoted to the improvement of furrow irrigation. With furrow irrigation in the form of anti-erosion measures, a number of authors recommend variable jet irrigation. At the same time, at the beginning of irrigation (air-dry soil), a minimum jet is fed into the furrow, which after passing 1/3 of the furrow length (after 3-7 hours) is doubled, then after the jet reaches the end of the furrow, the flow rate is reduced to the initial, minimum value. Another noteworthy agrotechnical technique to prevent irrigation erosion is to change the design of the furrow. The author suggested that instead of the usual irrigation furrows, microburrows should be performed with special rollers hung behind the cultivating organs. The microborose has a width of 3-6 cm, a depth of 3-4 cm and a living cross-sectional area of 2-10 cm2. The water consumption in it can vary from 0.050 to 0.2 l/s. Also, one of the important agrotechnical techniques to prevent irrigation erosion is the artificial structuring of the soil along the bottom of the furrow with polymer preparations of the K and PGP series synthesized in Uzbekistan. Studies

have been devoted to the use of preparations for irrigation [9], in particular, as practical recommendations, it is noted that with slopes of 0.01-0.04, it is necessary to seal the initial part of the furrows and fix them with polymers-structurizers with a norm of up to 80 kg / ha, and on steep slopes (0.1-0.22), when watering along the greatest slope, it is necessary to make preparations K-4, K-7, K-9, K-17 with a dose of up to 180 kg / ha.

According to Laktaev N.T. with slopes of 0.1 and more, it is necessary to switch to a contour farming system, and with slopes over 0.3 to build bench-shaped terraces.

RESULTS AND DISCUSSION

The authors recommend watering corn along contour furrows when irrigating typical subsidence gray soils with a slope of 0.04-0.15, and in the range of slopes from 0.15 to 0.25 – along jojac furrows. It is also noted here that in conditions of highly intersected terrain, where it is not possible to conduct irrigation along contour and jojac furrows, irrigation along the greatest slope is effective, but with the use of polymers K-4 and K-9 with a dose of up to 180 kg / ha.

Surin V.A. [7] notes the possibility of using furrow irrigation along the greatest slope with the help of flexible hoses on slopes even up to 0.3 and above this value to switch to terraced irrigation.

Contour irrigation. The use of the same irrigation jets as when watering at the highest slope of 0.098 l / s on contour furrows showed the watering time: 10, 33, 64 hours for the same watering standards with the same efficiency of irrigation techniques at the highest slope. The length of the contour furrow due to the increase in water absorption has become shorter – 65, 100, 110 m, i.e. it has been reduced by more than 2 times. Thus, the direction of irrigation across the slope can significantly change the absorption parameters by loosening compared to the field without loosening the soil indicates that contour furrows cut across the slope on slightly permeable soils increase the absorption of water into the soil, compared with the control – watering along the greatest slope, respectively, the irrigation parameters change.

Corn harvest when watering along contour furrows. In contour furrows with a row spacing of 0.7 m, when loosening the soil by 90 cm, water permeability increased and therefore, compared with the option without loosening the soil, irrigation jets were higher. Irrigation jets less than 0.105 l/s reduce the furrow length, above 0.185 l/ s cause soil flushing along the slope of contour furrows 0.02-0.02. Against the background without loosening, irrigation jets turned out to be 0.04-0.10 l/s in size. The advantages of contour irrigation on the slope against the background of loosening of the soil were expressed in the following.

- irrigation norms have decreased (compared to the option without loosening the soil);
- the number of watering decreased by one;
- the largest corn yield was obtained in the irrigation variant with a flow rate of 0.105 l/s – 374.2 c/ha for silage and 106.4 c/ha for grain at an irrigation rate of 3700 m3/ha.

CONCLUSIONS

1. Schematic diagrams have been developed for the use of irrigation techniques with closed use of water inside the field, which allows to reduce or eliminate water discharge outside the field and losses for filtration into the soil, in conditions of negative processes: subsidence, suffusion, soil erosion; to ensure water savings of up to 30-48% compared with conventional furrow irrigation.

2. Schemes have been developed for the placement of advanced furrow irrigation technologies on the on-farm irrigation system: contour irrigation.

3. In the conditions of the south of Uzbekistan, when choosing a basic technological scheme of irrigation, elements of irrigation equipment and irrigation methods, the following factors must additionally be taken into account:

- - high erudition and subsidence of soils;
- weak permeability of soils;
- the need to develop and implement relatively inexpensive irrigation methods and techniques with low operating costs.

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