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Short Communication

Scientific about Bosnovanie Applications Maloobjomnoj Technology Irrigation in the Conditions Mountain Agriculture in Azerbaijan

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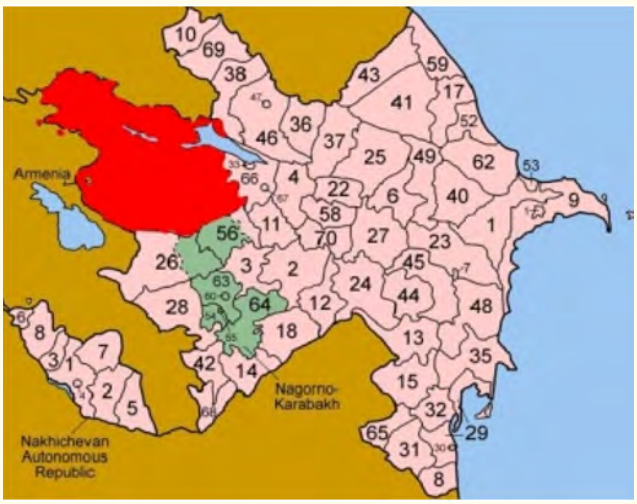
Introduction



Figure

At present, the issues of irrigation of slopes in Azerbaijan are not sufficiently covered in the field of agricultural reclamation. The issues of appropriate application of different irrigation methods and improvement of irrigation networks design are not sufficiently developed.

Research objectives: Today's task is to develop land with a high slope and steep slopes. In these conditions it is necessary, first of all, to replace an open irrigation network in a ground channel with application of devices for distribution of water between furrows by more perfect irrigation devices that will allow to radically solve a question Mechanization and automation of water distribution processes in irrigated fields.

Research moves

Given the importance of these questions we have developed concepts in relation to different slopes of the terrain. This enabled one site to cover a wide range of conditions where different methods and techniques of watering were tested.

The results of the numerous studies proven that on high grades (over 8^0) in order to avoid direct ingress on the soil of the pivot jet of undisturbed structure, need to move on Sector sprinkling. Sector angle in here depending on the angle of slope of the irrigation area.

When sprinkling terraced slopes, the amount of rain intensity is assigned to the slope and condition of the soil on the slopes of the terraces. At grades 6 - 80 it is possible to apply irrigation machines of type DTTs, with irrigation water supply on flexible hoses, namatyvajushhimsja and Razmatyvajushhimsja sprinkler machines, SIDAD and other kinds of systems of microirrigation [1,2].

On grades 4 - 5 degrees to use factories systems sprinkling on the basis of flexible high-pressure polymeric hoses. In this direction were conducted research by scientists of Georgia, Tadzhikstana, Kazakhstan, RF, etc.

Of particular interest are the research works entitled "Development of irrigation technology on the slopes of the Fergana Valley". According to the author, it is noted that in irrigated areas of Central Asia every year more and more acute There is a shortage of land and water resources. At the same time in staroorosha emyh areas with high population density and fertility there is a problem of employment of the working-age population.

Given the above, it is believed that steep slopes can successfully irrigated subsoil or drip, on silnovodopronicaemyh soils can be used sprinkling. The most common in the arid zone surface gravity irrigation. However, in the present form it is impossible to recommend them for irrigation of steep slopes with low water-permeable soils.

According to the results of years of experience it is proved that irrigation erosion on soils becomes very appreciable already at grades 0.008 - 0.03. At further increase of grades and application of irrigation technique it increases sharply [3-6]. Therefore, the more incline, the more cautious it is necessary to approach to development of slopes, applying here irrigations on furrows only in the advanced kind.

Research conducted by US (1998 - 2015 Gg) On the technique of watering row crops (cotton) and perennial plantations (vineyards and gardens) on large slopes, steep to 17^0 (slope 0.3) in the foothills of the Shamakha and Guba areas, the results of which show that the surface gravity irrigation on the furrows in improved form is quite acceptable for irrigation of land with large slopes to 0.3 (inclination angle 17^0), furrow irrigation and agricultural treatment are possible without a terrace. On grades more than 17^0 Need to terracing.

The methods and techniques of improving irrigation on furrows on large slopes and steep slope are:

- Layout of slopes surface;
- Selection of the optimal direction of irrigation furrows;
- Watering through the row on the compacted wheels of the tractor furrows;
- Selection of the optimal length of furrow and the cost of irrigation jet;
- The device of the perfect debitor irrigation network and technical means of distribution of water in furrows, providing exact dosing and adjustment of the irrigation jet in time;
- Optimization of irrigation regime of irrigation systems.

As noted above, the planning is a mandatory exercise in the development of slopes, but the possible volumes of it depend on the power of the Melkozemistogo layer of soil.

On Powerful loess and Loess Soils layout Correct Relief indigenous Way Giving it Level character. The volumes of planning works here more sizes of cuts reach in some places several meters (2 - 3 or more).

On soils with low power of Melkozemistogo layer, Podstilaemogo Galechnikami or rock, the layout is performed by small volumes in order to preserve the upper Melkozemistogo layer. Therefore, after planning works the relief of irrigated areas can be calm, or remain difficult, as in the development of arid lands, characteristic of the lands of Upper Shirvan and Guba-Hachma Regions.

One of the most important measures of methods and methods of improvement of irrigations on large inclines and steep slopes is the correctly chosen direction of irrigation furrows.

Direction of irrigation furrows in relation to the main slope of the terrain on steep slopes are chosen taking into account the quality irrigation and the possibility of mechanized processing of agricultural crops. For example, modern tricycles tractors can work across a slope on grades not more than 0.1 and Srednemoshhnye tracked tractors-on grades not more than 0.2. At high inclinations there is a danger of sliding of a tractor downwards on a slope. Therefore, in the fields at grades 0.1 c/x the technique should work only in the direction of the highest slope. At grades 0.2 - 0.3 They can handle the soil only going down the slope, and up they rise idle on the field, or on the road.

On grades more than 0.3 mechanized mezhdurjadnye of processing of cotton is practically impossible, and it is recommended to pass on terracing, having placed on terraces vineyards and gardens.

Based on the above considerations, the following classification of irrigated lands of the Foothill Zone in table 1 is proposed.

Here are some bands of the authors of Aliyev BG, GM Huseynov, GK Aslanov, Bashirov N, NT Laktaev, VF Nosenko, VG Kerkelashvili similar, but the recommendations on the technique of watering differ significantly. In particular Aliyev BG believes that on grades 0.1 - 0.25 and more, at a difficult terrain it is necessary to terracing.

Slope or slope characteristics	Distinctive Features	
	Recommended direction of irrigation furrows	Peculiarities of work of mechanisms at mezhdurjadnoj treatment of soil
Large slopes 0.008 - 0.03	Along the slope	Mezhdurjadnaja treatment, permissible along and across the slope
Very large slopes 0.008 - 0.03	Across the slope	
Gentle slopes 0.05 - 0.1	Along the slope of the complex terrain	At processing across a slope there are small difficulties in management of a tractor, places there is a shift of the tractor on some centimeters downwards on a slope
Slopes of average steepness 0.1 - 0.2	Along the slope	Mezhdurjadnaja processing is permissible only along the slope in the forward and reverse direction
Steep slopes 0.2 - 0.3	Along the slope	Mezhdurjadnaja treatment is permissible only along the slope, down the slope
Very steep slopes over 0.3	Across the slope across the terraces	Mezhdurjadnaja treatment across slope on Terraces

Table 1: Classification of irrigated lands of the Foothill zone by the amount of slope of the surface.

The author recommends terracing on grades 0.3 and more, and on grades 0.1 - 0.35 watering along a slope on short furrows a small stream. The author's recommendations are confirmed by the experiments we have put in the production conditions at Ojeb Institute of Erosion and irrigation of Anas in Shamakhi district.

Studies have shown that on large slopes of the terrain (0.008 - 0.03) irrigation furrows should be directed along the slope. Changing the direction of furrows on these slopes can increase the amount of planning work. In addition, at a poor quality of planning slopes along the furrows on individual sites may be less optimal, which are equal to 0.02 - 0.03.

As a result Low-quality irrigation In Ganja-Kazakh zone canopy grape plantations with each Year increased, the crop fell and after 8 Years after Planting had to carry out the reconstruction of vineyards.

On new vineyards on these sites give direction furrows on the highest slope.

On grades 0.03 - 0.1 at equal relief irrigation furrows it is expedient to cut with a bias 0.01 - 0.03 across the slope. This slope ensures the movement of water in the furrows with a small filling them. The furrows are not overfilled with water and do not cause soil erosion on the slopes. In case of complex terrain irrigation furrows are directed on the highest slope of the terrain.

It is not recommended to direct the furrows across the slope also on heavily-rocky lands, as there is a possible strong filtration of water through stony fractions of upstream furrows in the lower located. This phenomenon was observed on the slope of terrain 0.05 and the content of stony fractions in the amount of 55 - 85%. On grades 0.1 - 0.3 irrigation furrows should be directed on the greatest slope as on these inclinations at work tractors the tractor across a slope there is its slide and it is possible to rollover.

As can be seen from the foregoing, watering through the aisle on the compacted furrows is an important point for watering the steep slopes.

On the large slopes of the terrain the width of the spacing, obviously, should be 60 cm, increasing the width of the spacing to 90 cm. It does not allow to increase the irrigation stream (due to soil erosion), nor the length of the furrow.

Experiments have shown that on high grades at row 60 см and irrigation in each furrow the actual irrigation norms are 2 - 4 ths. M^3/GA and more against the estimated 1.2 - 1.5 ths. M^3 Ha.

At the same time on soils of Central Asia the width of a contour of humidifying of a soil reaches 1.1.. 1.2 m. Even more width of this contour under the compacted furrows. The compacted layer plays a role of the screen which promotes the better spreading of a moisture in parties.

In the compacted furrows, the time of reaching the end of the furrows is less, resulting in a more uniform hydration of the soil along the length of the furrow and less erosion of the soil.

Analysis of research results showed that on large slopes and steep inclines the width of the spacing should be 60 cm, and watering should be carried out through the row (through 120 cm) on the compacted wheels of the tractor furrows.

The characteristic feature of watering technology on steep slopes is the regulation of irrigation jets in time: At the beginning of watering give a small stream, then after 5 - 7 hours it is increased in 2 times, after the jet to the end of the furrow and stabilization of the discharge Reduce the flow rate to the original value.

The increase in the irrigation jet in the middle of watering allows to lengthen the irrigation furrow and increase the uniformity of its hydration.

At specified lengths of furrows and watering jets there is a slight flushing of soil at the beginning of furrow and accumulation smytoj soil at the end of a furrow.

The removal of soil beyond the irrigation area is negligible and makes up for the irrigation season no more than 0.8 - 1 mm soil layer or 8 - 10 cm/ha. Some disturbances of microrelief as a result of flushing and accumulation of soil are restored by operational planning. For irrigation on steep slopes, a perfect Vnutri hozjajstvennaja irrigation network is necessary. The Vnutri hozjajstvennaja irrigation network should ensure clear management of irrigation water flow.

Furrow grades	Watering jets L/s.		Furrow length, M
	At the beginning and end of watering	In the middle of watering	
0,01	0,12 - 0,1	0,25 - 0,2	200 - 150
0,03	0,05 - 0,045	0,1 - 0,09	100 - 85
0,06	0,04 - 0,035	0,08 - 0,07	85 - 80
0,1	0,025 - 0,02	0,05 - 0,04	65 - 55
0,2	0,015	0,03	55 - 50
0,3	0,013	0,025	55 - 45

Table 2: Optimum length of furrow and irrigation jet.

The most suited to these conditions is a tubular irrigation network consisting of closed distribution pipelines and irrigation pipes with openings. For example, according to the author's descriptions based on the results of the Lankaran in the natural field of research and embedded development Institute Erosion and irrigation Nana is a fully enclosed irrigation network for watering orchards and vineyards on Square 8,3 ra and the Polustacionarnaja irrigation network has become acceptable for solving problems. Since the self-pressure Polustacionarnaja irrigation network is recommended for irrigation of agricultural crops on large slopes of the terrain (0.008 - 0.3). For distribution of water in furrows here apply polyethylene pipelines (hoses) in diameter 100 - 160 mm.

Polustacionarnaja Irrigation Network in comparison with the temporary irrigation network in the earthen channel allows to 20 - 25% to save irrigation water, to increase the productivity of labor in the fields by 2 - 3 times, to improve the use of land by 10 - 15%, to support Optimal irrigation mode and due to this by 25 - 30% increase cotton yield. The closed irrigation network for watering of vineyards and gardens is even more technically perfect and economically effective.

Technical essence consists in closing of irrigation network in a ground channel by system in structure of stationary distribution and irrigation pipelines with regulating armature and progressive irrigation technique developed in Institute of erosion and irrigation Nana. The closed network allows quickly and according to the given technology to submit water on any area of the irrigated massif.

The new watering technology from the closed irrigation network allows to successfully combine the necessary variability of irrigation jets with the constant flow of water to the brigade. Such technology is achieved at simultaneous operation of two-three or more irrigation pipelines, one of which works with the maximum consumption, and the rest with the minimum expense.

The calculated diameters of watering holes allow to strictly dose the expenses of irrigation jets in furrows.

Conclusion

From above it follows that the advantage of watering on micro-furrows is reduction of erosion soil, uniform moistening on width of spacing and on length of a field, reduction of superficial dumping and increase of productivity of work.

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