

**UDK: 631.674/634.7: 634.8**

**COLLECTION OF LOCAL WATER FLOW FOR IRRIGATION  
VINEYERS IN PRE-FORGARD AREAS**

**Jumanov Azamat Norbutaevich,**  
**Turaev Fozil Jurakulovich,**  
doctoral student, Tashkent institute  
of irrigation and agricultural  
mechanization engineers, Uzbekistan

**Annotation.** The article deals with water supply of farmers in mountainous and fertile farms, water saving methods in vineyards, construction of vineyards with climate change, sustainable technologies for water use for irrigation of crops, water-saving irrigation technologies and their potential, water user associations and their problems, solving the water deficit problem and effective use of irrigation (rainwater), increased soil fertility, drip irrigation, emission control, increased production land use in mountainous and foothill areas. The development of viticulture will meet the needs of the local population in fruits and grapes, which, in turn, will help enrich the domestic market with cheap and high-quality products. The article considers new modern and non-traditional methods of irrigation (long-term non-traditional irrigation of intensive orchards and vineyards), by means of which it is possible to continuously supply plants with water, and if necessary, with nutrients. Dosed supply of water during the irrigation period allows to create the necessary moisture regime, increase the yield of agricultural crops. The article deals with the work done with the above-mentioned local methods of sewage collection, as well as recommendations on the irrigation of vineyards in the foothills.

**Key words:** non-traditional irrigation method, irrigation system, irrigation technology, water, garden, irrigation, soil fertility slope, collection of local sewage, irrigation of vineyards in the foothills.

**Introduction.** Water is the source of life for any living organism, including plants. The plant organism is an integral part of its internal structure and has a direct impact on its growth, development, yield and crop quality; complex physiological processes, such as photosynthesis, transpiration and respiration, are normal and intense. Gardens and vineyards are relatively drought-resistant, but they can grow well at the right time and yield rich crops, [1].

Smirnov K.V., Maltabar L.M. and other scientists have shown that the main part of the water consumes grapes for transpiration and breathing, and only a certain part of the water consumes directly for the production of organic matter. In the conditions of Central Asia, in particular Uzbekistan, to collect 1 centner of grapes, 44-50 m<sup>3</sup> of water,  $\square 3$  необходимо, is necessary.

Along with other spheres, agriculture plays an important role in further strengthening the country's economy. In conditions of shortage of irrigation water, the use of water-saving technologies for the cultivation of high-quality harvest in gardening is the most important and urgent task. Based on the achievements of science in the development of the agrarian sector and the improvement of people's well-being, the millennial experience of ancestors, the increase in the fertility of agricultural lands, the production of abundant and high-quality crops, the cultivation of various fruits such as grapes, walnut, almonds in the foothills plays an important role. For the cultivation of the vineyard in the mountainous and foothill areas of Uzbekistan, the most effective cities are the cities of Kitab, Shakhrisabz, Yakkabag of Kashkadarya region, Urgut city, Samarkand of Samarkand region, Baysun city, Denov of

Surkhandarya region, Akhangaran city, Parkent and Chirchik of Tashkent region.

Choosing a place for a vineyard in the mountain and foothill areas, you need to pay attention to: the planting area should be at least 10-15 hectares and should be able to expand it. To be able to mechanize the work of planting grapes and care for it, the slope of the area should not exceed 10 degrees, if the area has a slope, then it should be aligned in the form of a ladder. Wet slopes, which are not so light and dry in the summer, are suitable for vineyards. Grapes should be planted ahead of time on the southern slopes of the higher zone, so that the sugar content in it is high. For better use of rainwater, grape rows should be located across the slope. If the slope is 5-10 degrees, then the rows of grapes should be located across the slope, and if the slope is more than 10 degrees, then these places should be aligned in the form of a ladder. The area where the vineyard is to be built must be carefully prepared. Depending on the variety of grapes, soil and climatic conditions, the number of grape seedlings per hectare of foothill areas is determined. At the same time, it is desirable to take the distance between rows of grapes 2.5-3 m, and between seedlings in each row - 1.5-3 m [4].

In our Republic viticulture has been spreading since ancient times. And today, gardening issues are in the focus of the government. Today, the demand for raisins is not only responsible for the domestic market, but also for demand in the foreign market.

Increasing gardening to a high level, creating and locating fruit trees and grape varieties suitable for soil climatic conditions, using new and modern agrotechnologies to increase their productivity, thereby expanding the range of fruit and vegetable products and increasing the demand for fruits and grape products.

Republican irrigated lands, geological and hydrogeological objects, orchards and vineyards in the hills and foothills, their biological needs, soil types, as well as resource-saving irrigation technologies, new, modern and

innovative irrigation, irrigation methods (methods of unconventional irrigation of orchards and vineyards). For the irrigation season, water is the basis for ensuring water supply for water supply, crop yields, creating scientific foundations and using renewable technologies.

**Materials and methods.** In order to improve the technology of irrigation of orchards and vineyards, scientific research was carried out in the farm of the Normuminota of the Yakkabag district of the Kashkadarya region on the basis of scientific research.

The field of experiments is located in the Yakkabagsky district of the Kashkadarya region, on the territory of B. Khudoyarov's farm, directly adjacent to the mountain slopes. The proposed economic zone is located in the hilly part of the Khantog Range of the western branch of the Hissar Range. On this farm, grapes are grown according to the scheme 3x2.5, 3x2. Therefore, the number of seedlings per hectare is determined by the following formula:

$$X = \frac{10000}{a \cdot b}, \quad (1)$$

*Where:*

*X - number of seedlings per 1 hectare;*

*a is the distance between rows;*

*b is the distance between the seedlings in the row;*

The soil moisture accumulated due to precipitation in the lowlands of Uzbekistan is not sufficient for a good harvest of grapes. The moisture content of the soil is regulated by irrigation during certain periods of vegetation. In mountainous and foothill regions, where the annual amount of precipitation is 450-500 mm, vineyards can be irrigated or irrigated 1-2 times. Also timely and quality soil cultivation, weed control, mulching, collection of local wastewater, planting protective trees and other agrotechnical measures are also important. Knowledge of the agrophysical properties of soils is important for increasing

yields. The physical properties of soils and the physical processes occurring in them are among the main factors in the formation of soil nature. Therefore, much attention is paid to their study.

The Kashkadarya region has a continental climate, and at the same time, hot summers, very cold winters, northern arctic cold air currents, and low temperatures. In January, the average air temperature can drop from 0 ° C to + 2 ° C, sometimes from -15 ° C to -25 ° C in winter. Summer is hot and dry, and it lasts a long time. In July, the temperature rises from + 44 ° C to + 47 ° C during the day. In the second half of summer, Garmsel's winds blow for 7-15 days, causing significant damage to crops. The amount of precipitation in the northeast is increasing. Annual precipitation is 290-300 mm, precipitation is 320-550 mm and 550-650 mm in the mountains. Rain falls mainly in spring and winter. As you can see in Fig. 1, the maximum monthly rainfall during the months is three months, that is, March 50 mm, December 45 mm and 39 mm.

Mountain and foothill zones are fundamentally different from their plains, depending on their soil-climatic and economic conditions. Therefore, the creation of a vineyard, the selection of varieties, their placement and care in these areas require special attention. Currently, in a number of mountain and foothill areas of Uzbekistan (Bahmal, Urgut, Khatirchi, Kitab, Yakkabog and Shakhrisabz, etc.), vineyards are developed and raisins are grown from high-quality grape varieties. According to the research conducted by the scientific research institute of horticulture and viticulture of academician Mahmud Mirzaev, in the mountainous and foothill areas of the country it is possible to master more than 700 thousand hectares of land. However, this requires special preparation for the soil and climatic conditions of these lands, (6).

This is very important for gardening and viticulture in our country. In the mountain and foothill areas are more than 700 000 hectares. The creation of gardens and vineyards in these areas is an important factor in the efficient use of land resources. The use of modern irrigation technologies and conservation of

water resources in these areas leads to broad economic benefits. Our experience, saving irrigation water, led to irrigation 15-20% by irrigating irrigated gardens with saberable bulk water from polyethylene bassin. [8].

In order to obtain high grapes in the conditions of central Tajikistan, a system of intrasoil irrigation with polyethylene humidifiers is recommended; the diameter of the perforations is not more than 1 mm, the diameter of the tubes is of the order of 40 mm, the slope is 0.002 ... 0.005; on one row of vineyard - two tubes, located 0.5 m from the axis of the row; irrigation network is calculated on the following costs: humidifier -0.1 l / s.100 m, supply network -0.15 l / s 100 m.

It is advisable to carry out intra-soil watering with a decrease in humidity in a meter layer of soil to 65% of PPV. There are 2 .... 4 irrigation, the latter not later than 20 ..... 25 August; while at the end of the vegetation it is allowed to reduce the moisture content of the calculated soil layer to 50 ..... 55% PPV for the purpose of accumulating sugar in grape berries. [9]

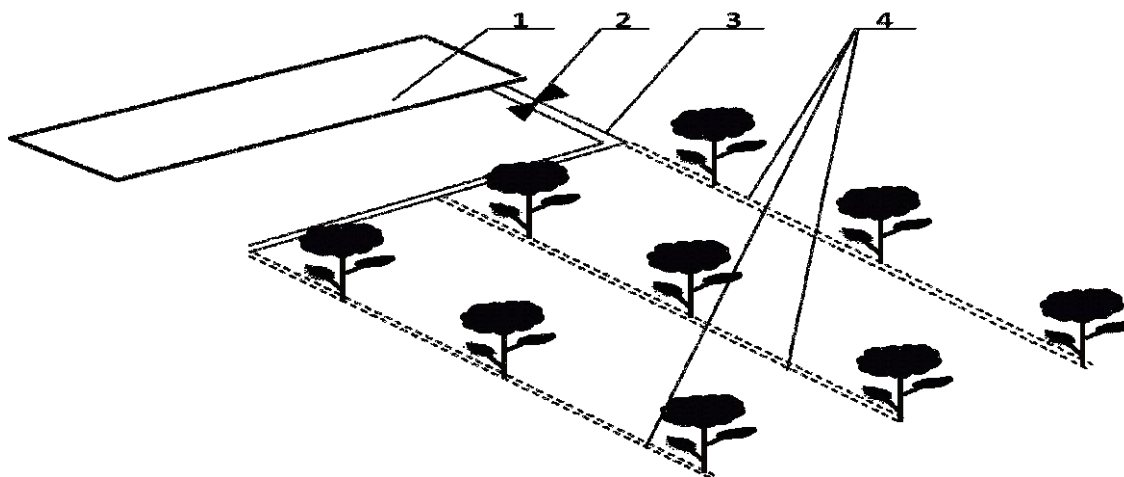
The most important factor causing the washing of water under the influence of natural local water is the shape, length and slope of the slope. The depth of soil degradation is more active on the slopes than on the plains. The thickness reduces the flow velocity and increases the length. It should be noted that large, heavy particles are at the bottom of the water flow, and light particles move along the surface of the water flow. Y. Denisov recommends the following expression for calculation of  $Q_{max}$ , formed by dissolved ice and glacial water for the rivers of the Central Asian region, (7).

$$\bar{M} = \frac{0.325 \cdot h}{2.64 \cdot \delta_h + 0.020 \sqrt{h}} : \text{л/сек, км}^2 \quad (2)$$

In this statement:





h- total thickness of water flow, mm;

$\delta_h$  is the mean square root of the basin. Km



15/5000

### Conditional signs

- |    |   |                                  |
|----|---|----------------------------------|
| 1. |  | <i>Pool for collecting water</i> |
| 2. |  | regulating valve                 |
| 3. |  | distribution pipeline            |
| 4. |  | irrigation hoses                 |

**Figure 2. Scheme of the proposed technology and technique of watering vineyards, planted on adyrnoy terraced slopes.**

In the picture below there is a swimming pool, where the main farm "Normuminota" collects natural rainwater. The length of the water area is 3.8 m, depth is 2 m, width is 2.2 m. Irrigation of grape seedlings "Sultan-Sort" was carried out on a farm field. In the first case, the use of water collected from alpinist gardens and vineyards in subsequent furrows.

When growing vineyards from mountain areas in the first case is that the water used for the subsequent furrows will move to the subsequent furrows. As a result of the process, because of the rain, particles are washed off the surface of the soil due to rain, heavy drops of rain fall almost by force, the slope of the parts of the soil is poured onto small particles, sprinkled around the same time due to the inclination and strong water flow, soil particles melt in dust, turbid permeable state.

The farm "Normumin ota", owned by the Water Users Association of the Yakkabag district of the Kashkadarya region, is working on irrigation with 3

hectares of land, with 3 local natural irrigation waters.

Prevents ingress of incoming and outgoing parts of the pond from local wastewater by spraying water and evaporating the film.

**Conclusion.** The farm "Normumin ota" located in the Yakkabagsky district of the Kashkadarya region was put into operation on a plot of 1 hectare on a test site. The water that raises the local flow is the pool. The total area of the pond basin is 2.2 m wide, 2 m deep, and its length is 3.8 m, i.e. 17 m<sup>3</sup> of water. A new irrigation technology was used to irrigate grapes when collecting these local streams and lack of water. In June and July, irrigation of vineyards by collecting water will be warmer, and a lack of moisture will be less productive, using collected water for irrigation as a result of the yield of grapes.

#### **literature:**

1. Program "Improving the production of vegetables, melons, potatoes, fruits and grapes and their complex reproduction in 2004-2010" Ministry of Agriculture and Water Resources of the Republic of Uzbekistan. T., 2003., 14-p.

2. Decree of the President of the Republic of Uzbekistan "On measures to further improve the reclamation status of irrigated lands and the rational use of water resources for the period 2013-2017" for No. PP-1958 of April 19, 2013.

3. Mirzaev, M.M., Sobirov, M.-Gardening - // T., "Meunat", 1987, 126-p.

4. Mirzaev, M.M.-Vinogradrstvo of the forehead-mountainous zone of Uzbekistan - // T., "Fan Publishing", 1980, 236-p.

5. Mirzaev M.M, Abdullaev.R.-Horticulture and vineyard in the mountain and foothill regions - // T., "Agriculture of Uzbekistan", 2010, No. 1., 20-p.

6. Rybakov A.A., Ostroukhova S.A. - Gardening in Uzbekistan - // T., "Ÿkituvchi", 1981, 506-p.

7. Sirliboyeva ZS, Saidova SR-Calculation of hydraulics- / T.2004, 91-p.

8. Sarimsakov M.M.- "The superiority of the fruit and vegetable products of Uzbekistan". Collection of articles of the international scientific and practical



conference. // T.2016, 325-329-p.

9. Pirov H. Intrasoil irrigation of grapes in central Tajikistan. Author's abstract. dis ... cand. с.-х.наук.- Moscow. GNU VNIIGIM. to them A.Kostyakov 1983 г.21 p.

10. Dzhavakyants Yu., Yu Gorbach V. Grapes of Uzbekistan. - T .: Шаарк, 2001 г.56-98 стр.

11. Shaidhodjaeva D.H., Abdumutalipova H. -Nerraditional method of watering intensive gardens and vineyards on the slopes of Adyrian lands - // T. "Educational Technologies" № 6 2016 г 27-31стр.

12. Durmanov A.Sh. // SAARJ Journal on Banking & Insurance Research (SJBIR). Vol 6, Issue 5, September 2017. DOI: 10.5958 / 2319-1422.2017.00021.2

13. Durmanov A.Sh., Yakhyaev MM, Measures to increase the volume of exports of fruit and vegetables // No. 4, November 2017. Herald of the Caspian.

14. Muradov R.A. Water use in conditions of shortage of irrigation water. T.: Journal "Bulletin of TashGTU", 2010, No. 1-2, p. 164-168.

15. Muradov R.A. Some issues of effective land use in WUAs in the case of water resources shortage. Sat. articles IX-international. scientific-practical conference. "Agrarian Science for Agriculture", Barnaul, Altai State University, 2014, p. 460-462.