

## Methods of Care and Irrigation of Fruit Trees

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### **ABSTRACT**

*Uzbekistan's irrigated fruit orchards and vineyards in the selection of resource-saving irrigation technologies, irrigation and watering plants at the request of the biological term and based on the standards of irrigation water use efficiency increases by 15-18%, the workers' labor and other costs will be reduced by 40 percent, and at the same time the quality of fruit and grape products will be produced.*

**KEYWORDS:** *stunted, horticulture, land reclamation, low pressure drip irrigation, fertilizer application, fresh orchard*

### **Introduction**

In all areas of the country, including the development of fruit growing, increasing fruit yield and improving quality, meeting the demand of the population for fruit products, expanding exports, efficient use of irrigated land and other resources, increasing soil fertility, improving living standards and economic development. plays an important role. Raising horticulture, creation and placement of fruit tree species and grape varieties suitable for soil climatic conditions, use of new and advanced agro-technologies with high efficiency in their cultivation, thereby expanding the share of fruit growing, meeting the demand of the population for fruit and grape products satisfaction is one of the most important and topical issues today. According to our seniors and health professionals, regular consumption of fresh and fresh fruits and grapes is an invaluable blessing for human health. It is no secret that the fruits and grapes grown in our country differ sharply from the fruits grown in other countries in their taste and flavor. Any fruit and grape varieties grown in the soil and climatic conditions of Uzbekistan receive fruitful energy from every season of the year, and in its fresh air and nature, in the sunlight, it becomes a refreshing and healing blessing. So, have new, productive and unique fruit trees and grape varieties suitable for the soil and climatic conditions of our republic been created today, and have the issues of their placement and cultivation in different soil and climatic conditions of our country been resolved? It has been more than 7 years since the introduction of foreign technologies for the development of horticulture in the country, the introduction of small, fast-growing (deaf and dumb) fruit seedlings and grafts [1-2]. The placement and maintenance of these seedlings in different soil and climatic conditions of the republic are also yielding positive results today. Our local gardeners, on the other hand, are propagating new,

delicious and fruitful tree species by tasting and grafting our local varieties. Small apple orchards began to be grown on the Kibray farm in the Tashkent region in the 1980s, but for some reason, due to the small size of the fruit and low yields, little attention has been paid to this area. Due to the large size and productivity of the small apple trees grown today, the area of orchards is expanding with great interest from entrepreneurial farms. In short, the interest in horticulture in our country is growing and good results are being achieved. In order to learn what to pay attention to when planting and caring for these trees, in early 2014, an apple orchard was established on 0.6 ha of the Central Experimental Farm of the Tashkent Institute of Irrigation and Land Reclamation, and young apple seedlings were planted in two fields. One-year observations have shown that apple seedlings grown in the open field grow well, while apple seedlings grown in the open field grow a little thinner and shorter. From this it can be seen that while covering the bottom of the seedling with grass has a negative impact on its normal development, we can conclude that the reason is that the soil under the seedling does not receive sunlight and air circulation is not good. On the contrary, apple seedlings grown in the open field developed well and showed target fruits in the second year. Our scientists and specialists have done a lot of research on the development of horticulture, the creation and reproduction of yellow and high-yielding fruit tree species, their placement and care in different soil-climatic conditions [4-5].

**Recommendations.** Which type of fruit is preferable in what soil-climatic conditions. In this regard, of course, it is better to rely on the recommendations of our experts and scientists. Only then will we be able to grow a variety of fruits from our own gardens and achieve high yields and efficiencies.

Table 1. Apple varieties recommended for planting in Uzbekistan.

(Horticulture, viticulture and winemaking in Uzbekistan

according to the research institute)

Tap .pak	Name of apple varieties	Provinces
1.	Afrasiyobi	Andijan, Samarkand, Surkhandarya
2.	Tashkent borovinkasi	All provinces
3.	Vaynsep	Karakalpakstan R., Bukhara, Kashkadarya, Navoi, Surkhandarya, Tashkent,
4.	Golden, Delishes	All provinces
5.	Delishes	Karakalpakstan R., Bukhara, Jizzakh, Kashkadarya, Samarkand, Fergana
6.	Starkrimson	Republic of Karakalpakstan, Bukhara,
7.	Rosemary white	All provinces
8.	Pervenets Samarkand	All provinces
9.	Renet Simirenko	All provinces
10.	Cancer	All provinces
11.	Yield	All provinces
12.	Parmen zimniy zolotoy	Jizzakh, Navoi, Samarkand, Surkhandarya, Tashkent, Fergana

In the care of young gardens it is desirable to plant technical crops, ie cotton, vegetables and melons between rows for up to 3 years. Because seedlings in young orchards do not fully use the sown area, in the process of caring for crops planted between rows, favorable conditions are created for young seedlings, in addition, the efficiency of irrigated lands increases, so efficient use of land and regular cultivation, feeding, and most importantly additional serves as a source of income. We have already mentioned that the planting of fodder crops and cereals has a negative impact on the growth and

development of seedlings. Great attention should be paid to the irrigation of young gardens. It is also recommended that the underside of young seedlings is often loosened to a depth of 12-15 cm, opening watering cans on both sides, keeping the soil moisture at a humidity of not less than 70%, depending on the mechanical composition of the soil and the arrival of weather (Fig. 2). In order to solve similar problems, in order to further expand the introduction of water-saving irrigation techniques and technologies in agriculture in our country, as well as the introduction of drip irrigation, the Republic of Uzbekistan The Resolution of the President of the Republic of Uzbekistan dated April 19, 2013 "On measures to improve the reclamation of irrigated lands and further improve the rational use of water resources for 2013-2017" and the Cabinet of Ministers of June 21, 2013 On measures for the introduction of other irrigation technologies and the effective organization of financing. Therefore, it is necessary to use and improve resource-saving technologies in the irrigation of orchards and vineyards, to organize irrigation based on the biological requirements of each type of crop, to focus on the introduction of automated irrigation technologies. In the current conditions of water scarcity, efficient use of water, proper organization of irrigation, agro-technical measures in the care of orchards and vineyards play an important role, while deciding the fate of the crop. In order to maintain the biological body structure of trees in intensive gardens, it is necessary to provide feeding conditions for its root part in the soil surface, 50–70 cm layer. This requires frequent moistening of the soil at low rates. In this regard, first of all, it is necessary to take into account the mechanical composition of the soil, the depth of groundwater and their level of mineralization, as well as the relief of the site.

Yu.M.Djavakyants (2006), R.M.Abdullaev, A.U.Aripov (2011) in their research, focusing on the care of seedlings in apple orchards, tillage, irrigation, feeding and other measures, on the care of orchards and vineyards made a number of recommendations. According to scientists, it is advisable to increase the rate of irrigation in the old orchards to 4-1 times in gray soils around 800-1000 m<sup>3</sup>, and 10-12 times in 300-500 m<sup>3</sup> on sandy and gravelly soils. This is of course the same standard that is followed when irrigated over conventional land, and the question of how much water norms should be when using drip or other water-saving irrigation methods is of course of interest to us [6-7].

**Research methods.** In our experiments, we aimed to develop a scientific basis for the following irrigation standards in the conditions of weak and moderately mineralized meadow gray soils, where groundwater in Tashkent and Syrdarya regions is 1-3 m. In irrigating young orchards and vineyards, light sandy loam and sandy, groundwater at a depth of 1.5 meters, using a low-pressure drip irrigation system in areas with a mineralization of less than 1 g / l, drip water consumption 3-4 liters per hour, groundwater 2 In medium sandy, meadow gray and light gray soils, the water consumption of drips is 5-6 liters per hour, and in heavy sandy soils - 7-8 liters per hour, depending on the mechanical composition of the soil 30-50 liters to moisten a 50 cm layer of soil in the first year for a tree, 80-120 liters to moisten a 1 meter layer of soil in the second and third years, with the exception of the groundwater level in the first two years and the need to obtain, the number of irrigations and the norms of seasonal irrigation to these indicators and the plant bi determination based on ological properties [9-11]. In the care of new orchards and vineyards, the constant supply of moisture to the layer where the main root part of the soil is located promotes the rapid development of seedlings and their rapid adaptation to soil conditions, good root system formation, as well as alternating nutrient and air exchange in the soil. In order to use irrigated lands efficiently and achieve high efficiency, apple, plum and walnut trees were planted in Chirchik Akhangaron area of Tashkent region, in the conditions of light gray and meadow gray soils with weak and moderately saline groundwater depth of 1.5-3 meters. It is expedient to plant and cultivate apple, peach, plum, pomegranate and fig trees in Altyn, Mirzaabad and Sayhunabad regions. However, drip irrigation systems cannot be introduced in all of these areas. This is due to the salinity of the soils and the high mineralization of groundwater.

Which method of irrigation is most appropriate to use when irrigating gardens and vineyards? If the water consumption in the traditional way is high, the soil, hydrological, hydrogeological conditions of the area may not be suitable for the use of drip irrigation system.

However, drip irrigation is recognized as one of the most economical and efficient methods. Experts admit that the advantage of drip irrigation is manifested primarily in the economy of water resources [12-14].

This is achieved, of course, due to the specificity of the irrigation regime, low evaporation, the fact that the water does not flow in vain.

In the end, depending on the type of crop, 20 to 80 percent of water is saved.

Most importantly, the soil does not harden when drip irrigation. As a result, there is no need for manual labor or cultivating.

- In exchange for the application of mineral fertilizers in solution, its efficiency is increased several times, up to 50% savings are achieved, and the plant is well saturated with nutrients.

- The main principle of irrigation in this method is that the water goes only to the roots of the plant. Managing the water and fertilizer application routine can speed up or slow down plant growth.

- Water saving in viticulture is 45%, in horticulture - 40%, in fruit and vegetable growing - 35-45%.

At the same time, the rate of increasing crop yields will reach 15-30%.

- As a result of the complete elimination of water discharge and a sharp decrease in the amount of leakage under the active layer, the water use coefficient increases to 0.98.

- In order to restore and increase the natural fertility of the soil, it is possible to apply mineral fertilizers, trace elements and chemical ameliorants in doses with irrigation water. Water-saving method of irrigating orchards and vineyards - it is very important to calculate the amount of water used in the use of drip irrigation networks and the cost of irrigation to determine the net income from the garden at the end of the year [16].

In this regard, we again refer to the recommendations and instructions of our scientists and experts.

### **Methods for determining the estimated water consumption of drip irrigation networks in the irrigation of gardens and vineyards.**

1. Water consumption of irrigation pipe:

$$Q_{C.K.}^{HET} = n \cdot q_{TOM} = 4 \cdot 166 = 664 \text{ л/год} = 0,18 \text{ л/с}$$

here:  $q_{TOM}$  – water consumption of the drip, л/с;  $q_{TOM} = 4 \text{ л/год}$

$n$  – number of droppers, pieces;;

$$n = \frac{l_{C.K.}}{b} = \frac{830}{5} = 166 \text{ piece}$$

2. Field pipeline water consumption:

$$Q_{Д.К.}^{HET} = Q_{C.K.}^{nem} \cdot n_{C.K.} = 0,18 \cdot 137 = 24,66 \text{ л/с}$$

here:  $n_{C.K.}$  – the number of irrigation pipes that receive water from the field pipe, pcs;

$$n_{C.K.} = \frac{l_{D.K.}}{a} = \frac{410}{3} = 137 \text{ piece}$$

3. Water consumption of the module site:

$$Q_{M.M.}^{HET} = 2 \cdot Q_{D.K.}^{nem} = 2 \cdot 24,66 = 49,32 \text{ л/с}$$

4. Water consumption of the distribution pipe:

$$Q_{T.K.}^{HET} = Q_{M.M.}^{nem} \cdot n_{M.M.} = 49,32 \cdot 1 = 49,32 \text{ л/с}$$

here:  $n_{M.M.}$  – the number of modular platforms that receive water from a distribution pipe, pcs;

5. The water consumption of the distribution pipe is related to the water consumption of the month in which it consumes the most water:  $Q^{nem} = \omega_{T.C.}^{nem} \cdot \bar{q}_{\Delta.K.} = 113,4 \cdot 0,58 = 65,77 \text{ л/с}$

here:  $\omega_{T.C.}^{nem}$  – irrigated area allocated for drip irrigation, ha;

$\bar{q}_{\Delta.K.}$  – the hydromodule ordinate of the garden and vineyard on the moon that consumes the most water, l / s.

3 distribution pipes will supply water to 113.4 hectares of land allocated for drip irrigation. This means that irrigated areas can be supplied with water from 1 distribution pipe at the same time:

$$Q_{T.K.}^{nem} = 49,32 \cdot 2 = 48,64 \phi 48 \text{ л/с}$$

We determine the calculated water gross water consumption for all pipes:

$$Q_{C.K.}^{БРУТТО} = \frac{Q_{C.K.}^{HET}}{\eta_{C.K.}} = \frac{0,18}{0,998} = 0,1804 \text{ л/с}$$

$$Q_{D.K.}^{БРУТТО} = \frac{Q_{D.K.}^{HET}}{\eta_{D.K.}} = \frac{24,66}{0,996} = 24,76 \text{ л/с}$$

$$Q_{T.K.}^{БРУТТО} = \frac{Q_{T.K.}^{HET}}{\eta_{T.K.}} = \frac{49,32}{0,994} = 49,62 \text{ л/с}$$

$$Q_{T.K.}^{HETTO} = Q_{\Delta.K.}^{\phi p} \cdot 2 = 24,66 \cdot 2 = 49,32 \text{ л/с}$$

бу ерда:  $\eta_{C.K.} = 0,998$ ;  $\eta_{D.K.} = 0,996$ ;  $\eta_{T.K.} = 0,994$  – We determine the calculated water gross water consumption for all pipes:

Based on the results of the above calculations, we accept the gross water consumption of closed irrigation networks in the drip irrigation system as follows:

1) irrigation pipe –  $Q_{C.K.}^{\phi p} = 0,1804 \text{ л/с}$

2) field pipeline –  $Q_{\Delta.K.}^{\phi p} = 24,76 \text{ л/с}$

3) distribution pipe –  $Q_{m.k}^{op} = 49,32$  л/с

Through these calculations, we determine the amount of disposable and seasonal water used to irrigate the gardens.

**Conclusions.** Taking into account the soil conditions of the area when choosing orchards and grape varieties, frequent loosening of tree saplings in the care of young orchards, arrangement of irrigation canals on both sides, not to reduce soil moisture to 70% in 0-50 cm soil layer, ensure good development of planted tree seedlings.

The use of low-pressure drip irrigation systems in the care of orchards and vineyards can save water and other resources, ie increase the efficiency of water and mineral fertilizers by 30-45%.

When gardens and vineyards are irrigated by drip irrigation, a constant microclimate is maintained between the rows, which is one of the main sources of quality and high yields. This will improve the agrophysical, water-physical and agrochemical properties of the soil. In conclusion, the most important thing for us today is the selection and introduction into production of the cheapest, most durable, convenient and resource-efficient irrigation techniques and technologies, thereby providing quality fruit growing, population and processing industries with raw materials. is to achieve uninterrupted supply.

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