International Journal for Innovative Engineering and Management Research

A Peer Revieved Open Access International Journal

www.ijiemr.org

IJIEMR Transactions, online available on 31th March 2021. Link https://ijiemr.org/downloads/Volume-10/ISSUE-3

DOI: 10.48047/IJIEMR/V10/I03/124

Title: **EFFICIENCY OF USING LOW PRESSURE DROP IRRIGATION TECHNOLOGY IN INTENSIVE GARDENS**

Volume 10, Issue 03, Pages: 575-578.

Paper Authors:

Murodov O.U[1], Saylixanova M.K[2], Kattayev B.S[3], Ibodov I.N[4], Muzaffarov M.M[5]

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

EFFICIENCY OF USING LOW PRESSURE DROP IRRIGATION TECHNOLOGY IN INTENSIVE GARDENS

Murodov O.U[1], Saylixanova M.K[2], Kattayev B.S[3], Ibodov I.N[4], Muzaffarov M.M[5]
Teacher of Bukhara Branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers[1]
Students of Bukhara Branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers[2,3,4,5]

Abstract: In the article, alluvial soils of Bukhara region were irrigated a total of 13 times when low-pressure drip irrigation was used in the experimental field, where apple seedlings were planted at 1.5–2.0 m groundwater level, when soil moisture before irrigation was 70-70-60% relative to ChDNS. Seasonal irrigation standards - 2535–2620 m3 / ha. or 1865–1780 m3 / ha of irrigation water compared to the control option. The article presents the impact of low-pressure drip irrigation on the growth, development and yield of apple seedlings and the results of experiments conducted to study this irrigation technology.
Keywords: Apple seedlings, yield, phenological observations, water scarcity, water saving technologies; low pressure drip irrigation, irrigation rate, seasonal irrigation rate, limited field moisture capacity (ChDNS), pre-irrigation humidity, groundwater, mineralization, irrigation techniques, vegetation period.

Introduction

As long as man is alive, he has a need. Needs are expressed in material form, first in the form of food, clothing, accommodation, and then in the form of others. It is necessary to produce the necessary delicacies to meet material needs. The material source for the production of delicacies is the soil.

Soil is a layer of upper fertile rock on the surface of the earth’s crust, capable of providing them with water and nutrients continuously during the growth and development of plants.

In order for human beings to sustain and improve their lives, it is necessary to preserve the soil, increase its fertility, and improve the water, air, nutrient, and heat regimes in the soil and their properties [1].

The organization of agricultural production in our country depends on the efficient use of available water resources, uninterrupted supply of water users during the growing season and the state of efficient operation and logistics of water management. Therefore, during the years of independence, extensive work has been done to reform the water management system, implement structural changes in the system, radically improve logistics, sustainable financing of modernization of water management enterprises. In particular, Presidential Decrees PQ-1958, PQ-3405, PQ-4499 were adopted to improve the reclamation of irrigated lands and the use of water-saving technologies in the country.

Today, the following types of water-saving technologies are used in the fields of our country.

1. Irrigation of the field with a film;
2. Use of flexible film pipes instead of pipes;
3. Application of underground irrigation technology, the amount of water supplied to the field is reduced to 25-30%, no tillage;
4. Irrigation (mainly annual crops are irrigated).
5. Drip irrigation [6].

Among these water-saving technologies, drip irrigation saves 20% to 80% of water compared to other irrigation methods, depending on the crop and soil type, reduces material resource consumption and manual labor when drip irrigation, and fertilizer is not used for fertilization.

The purpose of the study. The meadows of Bukhara region are scientifically based on the technology of local low-pressure drip irrigation of apple orchards of golden delishes in conditions of alluvial, mechanically heavy sandy soils, groundwater level 1.5–2.0 m, mineralization 1.0–3.0 g / l. development of scientific and practical recommendations for studying the order of irrigation and their impact on the growth, development and yield of apples.

Research objectives:

- determination of soil conditions (type, mechanical composition, water-physical properties and fertility) of experimental fields;

- determination of hydrogeological and reclamation conditions of experimental fields;

- Identification of scientifically based irrigation regimes for local low-pressure drip irrigation of apple orchards of Golden delishes in the conditions of alluvial soils of meadows of Bukhara region with a groundwater level of 1.5-2.0 m mineralization 1-3 g / l;

- To determine the water-physical properties of soil, salt regime, changes in groundwater level and mineralization, their growth, development, yield and cost-effectiveness of irrigation regimes of local low-pressure drip irrigation of orchards of Golden delishes.

Method of work: VV Shabanov and EP Rudachenko calculated the representativeness of the field experiment in the course of research, statistical analysis of productivity using WinQSB-2,0 and Microsoft Excel program, BA Dospekhov's method of analysis of variance and SPSS (Statistical Package for Social Science) computer mathematical statistical analysis methods were used using the program.

Scientific novelty of the research: Local low-pressure drip irrigation of apple orchards of Golden delishes variety in conditions of alluvial, mechanically heavy sandy soils, groundwater level 1.5–2.0 m, mineralization 1.0–3.0 g / l developed a scientifically based irrigation regime and identified their effectiveness in saving river water and reducing the negative effects of water scarcity;

- The effect of irrigation procedures on apple orchards "Golden" in the local low-pressure drip irrigation technology on their productivity was determined on the basis of the method of analysis of variance BA Dospekhov;

- In order to save water resources in times of water shortage, the use of local low-pressure drip irrigation technology in irrigation to increase the efficiency of 1 m3 of river water, the development of their apple seedlings growth, development, productivity and cost-effectiveness of irrigation procedures is urgent.

The main part. Field experiments Local low-pressure drip irrigation of apple orchards of Golden delishes variety in the conditions of alluvial, mechanically heavy sandy soils of meadows with groundwater level 1.5–2.0 m, mineralization 1.0–3.0 g / l in Vobkent district of Bukhara region scientifically based irrigation regimes have been developed for its growth, development, productivity and cost-effectiveness of irrigation regimes. The experiments were performed on the following systems (Table 1).

Mechanical composition of experimental field soil N.A. Kachinsky[5] by description heavy sand belongs to the type of soils with mechanical composition.

Table 1

Options	Irrigation technologies	Irrigation techniques Elements	Pre-irrigation soil moisture,% of ChDNS
1	irrigation, control	Egat length 200 m	factual observations
2	local low pressure drop irrigation in technology irrigation	irrigation pipe length 200 m	70-70-60
3			70-80-60

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

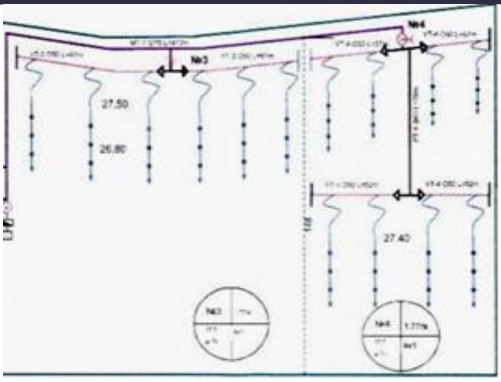
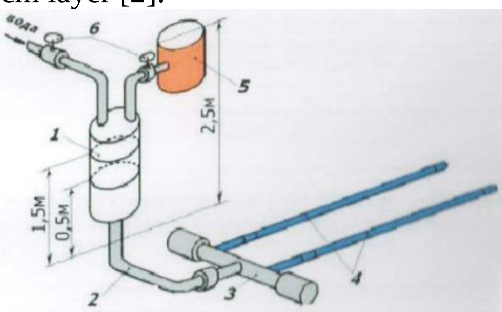


Figure 1. Schematic diagram of a low-pressure drip irrigation system in an experimental field

Experimental field Soil bulk density At the beginning of the growing season, the bulk density of the soil was 1.31–1.33 g / cm3 in the 0–30 cm layer, 1.39–1.41 g / cm3 in the 30–50 cm layer, and 1 in the 0–100 cm layer. , 40–1.42 g / cm3. In drip irrigation variant 2, at the end of the growing season, the bulk density of the soil is 1.32–1.33 g / cm3 in the 0–30 cm layer, 1.40–1.41 g / cm3 in the 30–50 cm layer, and 1 in the 0–100 cm layer. , 41–1.42 g / cm3, or in the 0–100 cm layer, an increase of at least 0.01 g / cm3 compared to other options. Towards the end of the growing season, in the 1st control variant, the bulk density of the soil was 1.34–1.36 g / cm3 in the 0-30 cm layer, 1.43-1.44 g / cm3 in the 30–50 cm layer, and 1 in the 0–100 cm layer. , 44–1.45 g / cm3, or an increase of 0.04–0.05 g / cm3 per vegetation in the 0–100 cm layer [2].



1 water level stable container; 2 water intake plastic pipe; 3 distribution pipe;

4-drop polyethylene pipe; 5 container of mineral and organic fertilizers; 6 taps. [3,4,9].

Figure 3. Scheme of low pressure drip irrigation system.

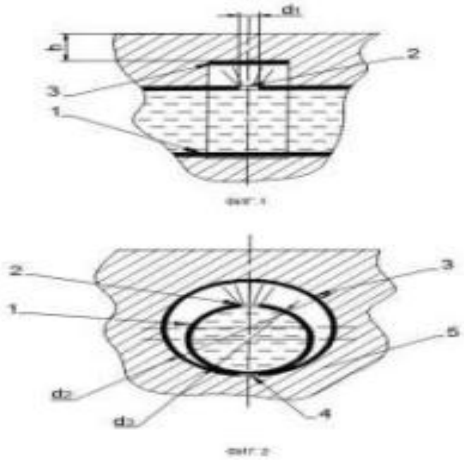


Figure 4. Constructive scheme of the drip

The number of drops in 1 seedling is 2 pcs.

The thickness of the 2 hoses is 0.1 mm.

Water consumption of the 3rd dropper is 3-3.7 l / h.

In system 4, the working pressure is 0.5-3 m.

The permissible amount of 5 suspended solids is 5 g / l.

The allowable size of the 6 axes is 1-2 microns.

7 Terms of use - field slope index 0.003 <i <0.03. [3,7,8].

In all variants irrigated using local low-pressure drip irrigation technology of the experiment, pre-irrigation soil moisture was carried out in the order of 70-70-60% and 70-80-60% relative to ChDNS. In the irrigated control variant, this figure was determined by factual observations.

According to the data in Table 2, in the production control variant 1 of the experiment, apples were irrigated five times according to the irrigation 1-2-1 scheme during the growing season, with irrigation norms of 1080-1210 m3 / ha and seasonal irrigation norms of 4400 m3 / ha.

Table 2

Options	Irrigation technologies	Irrigation techniques elements	Pre-irrigation soil moisture,% of ChDNS	Irrigation norm, m3 / ha	Irrigation between term, day	Seasonal irrigation norm, m3 / ha
1	irrigation, control	edge length 200 m	factual observations	1070-1110	26-31	3964
2	local low pressure drop irrigation in technology irrigation	irrigation pipe length 200 m	70-70-60	179-204	10-11	2060
3			70-80-60	179-210	11-13	2170

In the local low-pressure drip irrigation technology with an experimental irrigation pipe length of 200 m, pre-irrigation soil moisture was 70-70-60% relative to ChDNS, in option 2 irrigation was 13 times in 1-8-4 scheme, irrigation norms were 187-206 m3 /. ha and seasonal irrigation norms were 2535 m3 / ha. In the local low-pressure drip irrigation technology, the length of the irrigation pipe is 200 m, the pre-irrigation soil moisture is 70-80-60% relative to the ChDNS, in option 3, irrigation is 13 times in scheme 1-9-3, irrigation norms are 187-208 m3 / ha and seasonal irrigation norms were 2620 m3 / ha. This is 1780 m3 / ha or 59% less than the control[3,4].

The effect of drip irrigation on the growth, development and yield of apple seedlings.

Experimental control, ie when irrigated, the average fruit yield was 7.2 tons per hectare per year, while in the case of the local low-pressure drip irrigation system using 200 m of irrigation pipes, this figure averaged 9.5 tons per year.

Impact of irrigation technologies and procedures on apple yield (average 1 year)

Options	Irrigation technologies	Irrigation techniques Elements	Pre-irrigation soil moisture,% of ChDNS	Seasonal irrigation norm, m3 / ha	Economical water, m3 / ha	Gross productivity t / ha	The difference +/-
1	irrigation, control	edge length 200 m	Traditional irrigation	4400	-	7.2	
2	local low pressure drop irrigation in technology irrigation	irrigation pipe length 200 m	70-70-60	2535	1865	9.4	+2.2
3			70-80-60	2620	1780	9.5	+2.3

In this field, the number of irrigations was 4 times, the seasonal water consumption was 4,400 m3 / ha, and the average annual gross yield was 7.2 t / ha. The maximum yield in the experimental field (9.5 t / ha) was obtained in the norm of 2620 m3 / ha in the case of pipes of local low-pressure drip irrigation system with a length of 200 m, pre-irrigation soil moisture in the order of 70-80-60% relative to ChDNS.

Based on the results of experimental observations and laboratory analysis, the following conclusions are presented:

1. The following optimal technical and design elements and parameters of local low-pressure drip irrigation technology were identified: 1 number of drips on 1 apple seedling; pipe wall thickness 0.1 mm; water consumption of the drip is 3-3.7 l / h; working pressure in the system 0.5-3.0 m; the allowable amount of suspended solids is 5 g / l and the permissible size of suspended solids is 1-2 microns. As a result of the research, it was possible to develop local low-pressure drip irrigation technology based on optimal technical and design parameters.

2. Local low-pressure (TIIAME BB) drip irrigation technology is 30% cheaper than drip irrigation technology in Israel and Turkey, and all components are made from local raw materials in our country, which makes it more cost-effective.

Literature:

1. Hamidov M.H., Shukurllaev X.I., Mamataliev A.B. - Agricultural hydraulic reclamation‖. Sharq., Tashkent - 2008.

2. OU Murodov Development of the effectiveness of the use of intensive drip irrigation in saline soils of Bukhara region // Dissertation for the Master's degree in 5A450201 - "Hydromelioration" // - Tashkent, 2019. - UDK 631.445.52: 634: 631.674.6: (575.146) (043)Page 94

3. Khamidov M.X., Suvanov B.U. application of drip irrigation technology in cotton irrigation // Journal of Irrigation and Land Reclamation. - Tashkent, 2018. - №2 (12). - B. 8-12.

4. Murodov O.U., Kattaev B.S., Saylixanova M. K. // The use of sprinkler irrigation in the cultivation of agricultural crops // " Proceeding of The ICECRS.Conference of Management of Islamic Education Leadership In The Era of Revolution 4.0 "conference. - Indonesia 2020.

5. O.U.Murodov, B.S.Kattayev, M.K.Saylixanova, I.N.Ibodov Smart irrigation of agricultural crops,Middle European Scientific Bulletin Volume 3, August 2020, Pages 1-3