Scienta Press Journals

American AgriTech
JOURNAL OF AGRICULTURAL TECHNOLOGY INNOVATION AND SUSTAINABILITY

# Agrotechnical Measures For The Care Of Intensive Apple Orchards

**Sarimsakov Maqsudxon Musinovich, Amonov Dilshod Hasanovich, Murodov Otabek Ulug'bekovich, Ruziyeva Mavluda Anvarovna**
Bukhara State Technical University - Uzbekistan, Bukhara region, 200100, Bukhara, Q. Murtazaev street, 15.
**E-mail:** murodovou@gmail.com

**Abstract**

This article presents the results of research on drip irrigation of intensive orchards aimed at obtaining high-quality yields from repeated crops under conditions of water scarcity and improving the reclamation condition of agricultural lands. The study presents experimental results on the effect of irrigation regimes on the yield of the Cripps Pink intensive apple variety grown as a repeated crop under the conditions of meadow-alluvial soils in Bukhara region, where the groundwater level is located at a depth of 1.5–2.0 m.

**Keywords**: drip irrigation, groundwater level, intensive orchard, Golden Delicious, irrigation regime, field moisture capacity (FMC), yield

*This work is Licensed under a Creative Commons Attribution 4.0 International License.*

**Introduction.** Today, under conditions of limited water resources and increasing demand for water, the efficient use of available water resources is one of the most important measures for obtaining high and quality yields from agricultural crops. Currently, the majority of agricultural production is obtained from irrigated lands. In Uzbekistan, irrigated lands account for 1–2 percent of the total land area.

**Methods.** Field experiments were conducted in 2023–2024 in intensive apple orchards belonging to the "Garden Bukhara Agrocluster" cluster farm in Vobkent district, Bukhara region.

The fields of the “Garden Bukhara Agrocluster” cluster farm in Vobkent district are geographically located at 39°04′31″ latitude and 64°03′21″ longitude, at an elevation of 223 m above sea level. The soils of the experimental site are long-term irrigated meadow-alluvial soils with medium and heavy loamy mechanical composition; the groundwater level is deep (2.0–3.5 m).

For the 2023 harvest, ploughing and leaching of salts were carried out on the control plot on November 26, 2022. In February 2023, tree shaping and fertilization with phosphorus fertilizers were carried out, and chemical preparations were applied on April 9–11 to protect the trees from diseases and insect pests.

**Table 1**

**Agrotechnical measures carried out in fruit orchard maintenance**

| No. | Irrigation method | Agrotechnical measures carried out | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Application of mineral fertilizer | Ploughing | Leaching of salts | Tree shaping | Chemical treatment of | Pest control | Spring ploughing | Land leveling and furrow | Irrigation | Inter-row cultivation | Harvesting |
| 1 | Control plot | 26.11 | 24.11 | 13.12 | 20.02 | 09.04 | 17.04 | 19.04 | 21.04 | 08.05 | 12.05 | 25-26.08 |
| 2 | | | | | | | 03.05 | | | 21.05 | 24.05 | |
| 3 | | | | | | | 23.06 | | | 10.06 | 14.06 | |
| 4 | | | | | | | | | | 26.06 | 28.06 | |
| 5 | | | | | | | | | | 17.07 | 20.07 | |
| 6 | | | | | | | | | | 11.08 | 14.08 | |
| 1 | Plot with drip irrigatio | 26.11 | 24.11 | 13.12 | 20.02 | 09.04 | 17.04 | 19.04 | 21.04 | 08.05 | | 25-26.08 |
| 2 | | | | | | | 03.05 | | | 13.05 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | n system (TST) | | | | | | 23.06 | | | 22.05 | | |
| 4 | | | | | | | | | | 03.06 | | |
| 5 | | | | | | | | | | 12.06 | | |
| 6 | | | | | | | | | | 21.06 | | |
| 7 | | | | | | | | | | 03.07 | | |
| 8 | | | | | | | | | | 14.07 | | |
| 9 | | | | | | | | | | 27.07 | | |
| 10 | | | | | | | | | | 07.08 | | |
| 11 | | | | | | | | | | 19.08 | | |

During the flowering and fruit-setting period of the fruit trees, chemical preparations were applied against insect pests on April 16–17. On April 19–21, spring ploughing between the orchard rows, land leveling, and opening of irrigation furrows were carried out. The first irrigation was performed on May 8. The inter-row areas of the control plot were cultivated four times using a deep loosener. Harvesting of ripe fruit was carried out manually on August 25–26.

Experts and researchers recommend introducing drip irrigation primarily on irrigated lands where water resources are chronically scarce during the growing season; in fruit orchards and vineyards irrigated by pumps with high operating costs; on lands allocated to vegetable and melon crops and other high-profit crops; on steep slopes subject to irrigation erosion; and on light soils that are non-saline or only slightly saline.

**Table 2**

**According to the recommendations of the BUVITI named after Acad. M. Mirzaev**

| Fruit types | | Irrigation rate, $m^3$/ha |
|---|---|---|

| | Number of irrigations | Soil types | |
|---|---|---|---|
| | | Gray soils | Sandy-gravelly soils with shallow groundwater |
| Young pome-fruit orchards | 8-10 | 500 | 350 |
| Young stone-fruit orchards | 10-12 | 500 | 300 |
| Bearing pome- and stone-fruit orchards | 4-6 | 800-1000 | 300-500 |
| Winter irrigation of pome- and stone-fruit orchards | 2-3 | 1500-2000 | - |

**Conclusion.** Based on the information presented above and taking into account the soil and climatic conditions of the farm, the following conclusions can be drawn:

The orchard areas of the “Garden Bukhara Agrocluster” cluster farm in Vobkent district, where our experiments were conducted, are located in a desert-steppe area and consist of fields with different slopes. Therefore, the use of drip irrigation in these orchards, first, increases the efficiency of land and water resource use; second, stabilizes the reclamation condition of irrigated lands by preventing the rise of groundwater and reducing secondary salinization, thereby preserving and potentially improving soil fertility; and third, reduces the various costs associated with orchard maintenance several times.

## References

[1] Murodov Otabek Ulugbekovich, Saylixanova Maftuna Komiljonovna, Kattayev Bobir Sobirovich, Muzaffarov Muxriddin Murodovich. Determination of efficiency of groundwater use in irrigation of millet planting, Euro-Asia Conferences, 2021/3/31, 131-134.

[2] Murodov, O. U., Teshayev, U. O., Amrulloev, O. I., & Islomov, S. U. (2021). Determining the efficiency of the use of underground water in irrigation of tarik. Экономика и социум, (3-1 (82)), 187-191.

[3]. Murodov Otabek Ulugbekovich, Kattayev Bobir Sobirovich, Saylixanova Maftuna Komiljonovna, & Ibodov Islom Nizomiy o`g`li. (2020). Smart irrigation of agricultural crops. Middle European Scientific Bulletin, 3, 1-3. https://doi.org/10.47494/mesb.2020.3.16

[4] Murodov O. U., Kattaev B. S., Saylikhanova M. K. Efficiency use low pressure drip irrigationof in small gardens //Школа Науки. – 2020. – №. 2. – С. 6-9.

[5] Murodov O. U., Kattaev B. S., Saylikhanova M. K. Efficiency of using drip irrigation technologies in agriculture // Science and Education. – 2020. – Vol. 1. – No. 1. – pp. 177-184.

[6] Ro'Ziyeva M. A., Najmiddinov M. M. Effect of water with different salinity levels on the productivity of a portable suitcase-type solar water desalination unit // Science and Education. – 2022. – Vol. 3. – No. 4. – pp. 218-221.

[7] Ulugbekovich, M. O., Sobirovich, K. B., & Komiljonovna, S. M. (2025). EFFICIENCY USE LOW PRESURRE DRIP IRRIGATIONOF IN SMALL GARDENS. Лучшие интеллектуальные исследования, 58(2), 175-182.

[8] 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.