Volume 4, Issue 2, February - 2026
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

PERIODS AND STANDARDS OF INTENSIVE APPLE IRRIGATION

Murodov Otabek Ulugbekovich
Mukhtorov A'zamjon Amon o'g'li
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 in order to increase the yield of high-quality crops from repeated crops and improve the land reclamation conditions under water shortage conditions. The results of experiments conducted to study the effect of irrigation regimes on the yield of the Golden Devishes variety of intensively planted apple trees in the conditions of repeated alluvial soils of the Bukhara region with a groundwater level of 1.5–2.0 meters are presented.

Keywords: Drip irrigation, groundwater level, irrigation regime, ChDNS, seasonal irrigation rate, intensive irrigation, Golden devils, productivity, economic efficiency.

Introduction

Today, in the context of limited water resources and increasing demand for water, the effective use of available water resources is one of the most important measures for producing high-quality agricultural crops. Currently, the bulk of agricultural crops is grown on irrigated land. Irrigated land in Uzbekistan accounts for 1-2 percent of the total land area.

Methods. When irrigating apple orchards, the S.N. Ryzhov formula is used to determine irrigation standards:

$$M=100*d*h*(W_n-W_m)+k$$

W_n- Limited field moisture capacity relative to soil weight, %
W_m-soil moisture before irrigation, %
d-soil bulk density, g/cm^3
h-calculated soil layer, m
k-water spent on evaporation, m^3/ha

The duration of irrigation and irrigation rates were determined taking into account that the water consumption per hour from each drip irrigation device is 1.0-1.4 liters.

Volume 4, Issue 2, February - 2026
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

Table 3.7.1 Terms and standards of irrigation of apple orchards, m^3/ha.

	Indicators	Irrigation					Seasonal irrigation rate, m^3/ha
		1	**2**	**3**	**4**	**5**	
Irrigation	Irrigation periods	18.06	15.07	29.07	19.08	9.09	
	Irrigation interval, days		25	15	20	20	
	Irrigation rate, m^3/ha	940	1015	1025	1020	1080	5080
	Irrigation duration, hours	15,8	17,0	17,5	17,2	19,0	

According to the data obtained, in the control variant with irrigation, apples were irrigated 5 times during the experimental period at a rate of 940-1080 m^3/ha, the seasonal irrigation rate was 5080 m^3/ha, and the interval between irrigations was 15-25 days.

Also, the apple was irrigated 11 times with a soil moisture content of 70-70-65%, 12 times with a soil moisture content of 70-75-65%, and 13 times with a soil moisture content of 75-80-65%. The irrigation rates were 265-295 m^3/ha on average, the irrigation interval was 7-10 days, and the duration of drip irrigation was 6 hours 20 minutes, 7 hours 45 minutes, depending on the irrigation rate. The seasonal irrigation rates before irrigation were 3060 m^3/ha with a soil moisture content of 70-70-65%, 3355 m^3/ha with a soil moisture content of 70-75-65%, and 3517 m^3/ha with a soil moisture content of 75-80-60%.

When drip irrigation was used, a large amount of water was saved in the variants. In particular, compared to the control variant (5080 m^3/ha) with a soil moisture content of 70-70-65%, drip irrigation saved 2020 m^3/ha or 39.7% water, while compared to the control variant with a soil moisture content of 70-75-65%, drip irrigation saved 1725 m^3/ha or 34% water. The studies revealed that in the 75-80-65% drip irrigation variant, 1563 m^3/ha less water was used than in the control variant, or 30.7% water was saved.

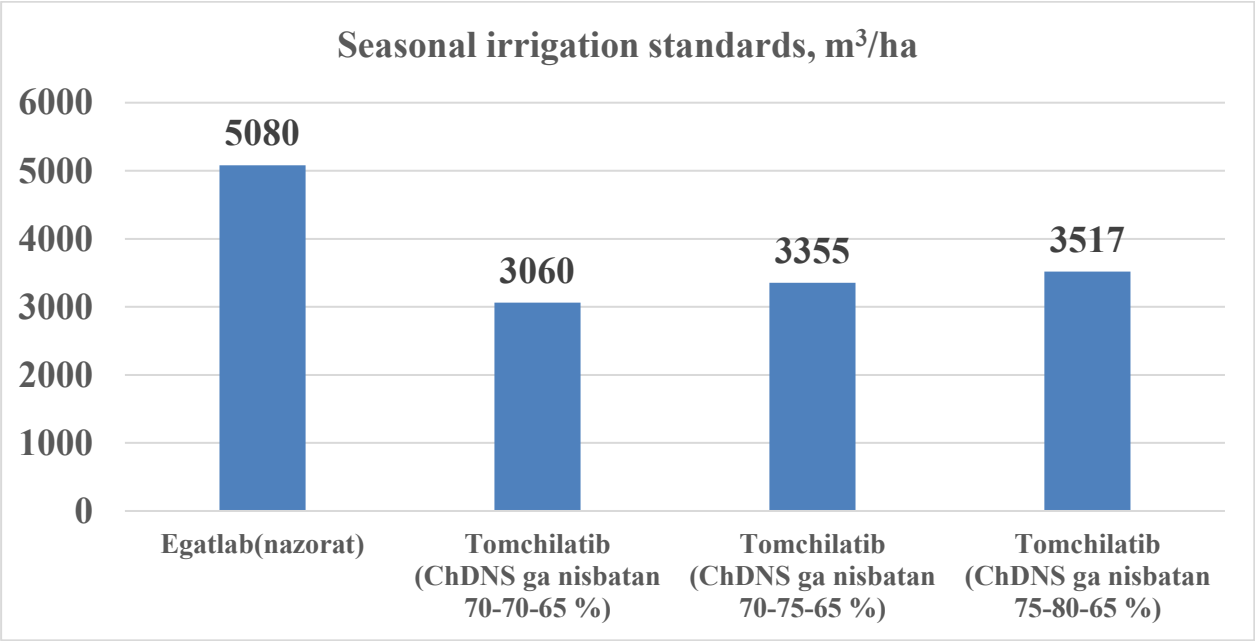

Figure 3.7.1. Irrigation methods and seasonal irrigation rates in m^3/ha.

In the case of the irrigated variant, an average yield of 11.5 t/ha was observed, while in the case of the 2nd variant with drip irrigation, the average yield was 14.7 t/ha with a soil moisture content of 70-70-65% compared to the ChDNS, which was 3.2 t/ha higher than the control. In the case of the 3rd variant with drip irrigation, the average yield was 16.4 t/ha with a soil moisture content of 70-75-65% compared to the ChDNS, while in the case of the 75-80-65% irrigation with a soil moisture content of 75-80-65% compared to the ChDNS, the average yield was 18.5 t/ha, which was 7.0 t/ha higher than the control.

Conclusion

We recommend the following for the use of drip irrigation systems in intensive cultivation of the Golden Devishez apple variety:

❖ Training specialists (farmers or mirabs) in the regions to design, build and operate drip irrigation systems;

❖ With drip irrigation, the average yield was 18.5 t/ha with a soil moisture content of 75-80-65% relative to the NDW, and a higher yield of 7.0 t/ha was observed compared to the control option.

When drip irrigation technology was used, the Golden Devishez apple variety was grown intensively in the 3-8-2 system in option 4, with soil moisture of 75-80-65% relative to the recommended moisture content, and 13 irrigations were carried out during the season, with a total of 3355-3370 m3/ha of water consumed, and the average yield was 18.5 t/ha, with a profitability of 81.4%.

References

1. 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.
2. 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.
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 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.
5. Ro'Ziyeva M. A., Najmiddinov M. M. Sho'rlik darajasi turlicha bo'lgan suvning jamadon tipidagi ko'chma quyosh suv chuchiktgich qurilmasining unumdorligiga ko'rsatadigan ta'siri //Science and Education. – 2022. – Т. 3. – №. 4. – С. 218-221.
6. Муродов О. У., Каттаев Б. С., Сайлиханова М. К. Қишлоқ хўжалигида томчилатиб суғориш технологияларидан фойдаланиш самарадорлиги //Science and Education. – 2020. – Т. 1. – №. 1. – С. 177-184.
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. O U Murodov, U O Teshayev, O I Amrulloev, S U Islomov. Determining the efficiency of

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

Volume 4, Issue 2, February - 2026
ISSN (E): 2938-3781

the use of underground water in irrigation of tarik. Ekonomika i sotsium, 2021, 187-191.

9. Ibragimov I A, Juraev U A, Inomov D I. Hydromorphological dependences of the meandring riverbed forms in the lower course of the Amudarya river //IOP Conference Series: Earth and Environmental Science. – IOP Publishing, 2022. – Т. 949. – №. 1. – S. 012090.
10. Muradov, O., Kattayev, B., Saylixanova, M., & Polvonov, D. (2019). UZBEKISTAN INTENSIVE TECHNOLOGIES OF DRIP IRRIGATION EFFICIENCY. In Приоритеты мировой науки: новые подходы и актуальные исследования (pp. 55-59).

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8