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Agrobiological characteristics of apple varieties grown in Khorezm oasis

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Abstract. *This article describes the results of studies on the agrobiological characteristics of apple varieties suitable for drying. Here, the main indicators of the apple varieties selected for the experiments were analyzed. As a result of the research, scientifically based conclusions were made.*

Keywords. *Apples, productivity, quality, autumn and winter varieties,*

Enter . The climatic changes observed in recent years and the year-by-year increase in population demand the introduction of varieties of medicinal plants that are resistant to external factors and have food value in all countries. According to the information provided by FAO, 44% of orchards on earth correspond to the share of introduced plants. Currently, the scientists of countries such as the USA, Poland, Turkey and Japan, which are the leaders in the cultivation and export of apples around the world, are conducting scientific research on the quality and shelf life of apple fruits. In the same way, it is necessary to develop effective elements of preservation of apples grown in our republic. In recent years, in this regard, measures have been taken in our republic to increase the shelf life of apple varieties suitable for storage, to improve quality indicators while preserving their biochemical composition.

The research was conducted in Khiva district of Khorezm region during 2021-2023. Observations were carried out on a 10-ha field for all varieties selected in this farm. There are many apple orchards in this district on large areas of land. Observations were made on the basis of apple varieties at the "DAVRON" farm in the Gandimyan neighborhood, which was selected for the experiment. (See Table 1).

Observations were made on the agrobiological characteristics of the studied varieties from flowering to ripening. According to the results of observation, the ripening period of the autumn varieties is the shortest in the Kizy Taram apple variety from

115 to 120 days, in the Mantet variety in 139-140 days, and in the Golden Delishes variety, these periods are 140-143 days. From the same autumn varieties, it was shown that the Red Delishes variety ripened in 145-149 days. It was also observed in the Kizy Taram apple variety, which is distinguished by the shortest ripening period among the autumn varieties suitable for storage. Due to the early ripening of the Kyzyl Taram apple variety, it was observed that the size of the fruits is also small compared to other varieties.

Table 1

Agrobiological characteristics of apple varieties (2021-2023)

№	Varietal name	Years	From flowering to ripening, days	Productivity, t/ha	A crop suitable for drying		Invalid crop	
					т/га	%	т/га	%
1.	Red Delishes	2021	145±2	40,1±1	39,1±3	97,5	1,0	2,5
		2022	147±3	42,3±3	41,2±2	97,4	1,1	2,6
		2023	149±3	43,1±2	41,9±3	97,2	1,2	2,8
		Average	147	41,8	40,7	97,4	1,1	2,6
2.	Golden Delishes	2021	140±2	48,3±4	47,5±4	98,3	0,8	1,7
		2022	145±2	49,6±3	48,7±3	98,2	0,9	1,8
		2023	143±4	50,8±2	50,0±3	98,4	0,8	1,6
		Average	143	49,6	48,7	98,3	0,8	1,7
3.	Mantet	2021	139±3	39,2±2	38,1±2	97,2	1,1	2,8
		2022	141±2	41,1±3	39,9±1	97,1	1,2	2,9
		2023	140±2	42,4±2	41,1±2	96,9	1,3	3,1
		Average	140	40,9	39,7	97,1	1,2	2,9
4.	Red apple	2021	115±2	45,2±2	44,2±2	97,8	1,0	2,2
		2022	120±3	48,6±3	47,5±3	97,7	1,1	2,3
		2023	118±1	44,1±1	43,2±2	98,0	0,9	2,0
		Average	118	46,0	45,0	97,8	1,0	2,2
5.	Renet Simirenko	2021	168±3	44,6±3	43,3±2	97,1	1,3	2,9
		2022	169±2	43,3±3	42,1±2	97,2	1,2	2,8
		2023	167±3	45,2±2	43,8±3	96,9	1,4	3,1
		Average	168,0	44,4	43,1	97,1	1,3	2,9
6.	Rosemary bely	2021	169±4	50,1±2	49,4±3	98,6	0,7	1,4
		2022	168±2	51,4±4	50,8±2	98,8	0,6	1,2

		2023	170±3	54,2±3	53,4±3	98,5	0,8	1,5
		Average	169,0	51,9	51,2	98,7	0,7	1,3
7.	Farangiz	2021	145±3	40,2±2	39,2±4	97,5	1	2,5
		2022	146±2	41,1±4	39,9±2	97,1	1,2	2,9
		2023	148±3	40,3±3	39,1±3	97,0	1,2	3,0
		Average	146,0	40,5	39,4	97,2	1,1	2,8
8.	Jerome	2021	150±2	45,1±3	43,7±3	96,9	1,4	3,1
		2022	152±2	46,8±4	45,1±2	96,4	1,7	3,6
		2023	149±3	46,8±3	45,3±2	96,8	1,5	3,2
		Average	150,3	46,2	44,7	96,7	1,5	3,3

When analyzing the yield indicators of autumn varieties, the highest average yield was Golden Delishes, and an average yield of 49.6 tons per hectare was obtained. At the same time, the Kyzyl Taram apple variety showed a high productivity index, and an average yield of 46.0 tons per hectare was obtained.

Among edible and drying autumn apple varieties, Red delicacies and Mantet varieties have the highest number of unusable apples in terms of yield.

In particular, the yield of the Red Delishes variety was 41.8 tons, correspondingly, the apples unsuitable for processing and consumption were 1.1 tons, which is 2.6% of the total harvest. Similarly, in the Mantet variety, the yield was 40.9 tons, but it can be seen that 1.2 tons or 2.9% of the yield was separated into poor quality products.

If it is analyzed in terms of years, it is shown that the non-storable crop grown in the last year 2021 has increased up to 3.1%. Due to the improper use of these cultivation, soil and climatic conditions, such a poor quality product is grown and storage problems arise.

Therefore, in our research, it is possible to obtain high-quality, storable apple fruits in the Golden Delishes variety. The lowest indicator was recorded in this variety, the total yield was 49.6 tons, and the low-quality yield was 0.8 kg, which was 1.7% of the total yield.

According to the results of observation, among the experimental winter varieties, the ripening period of Rosemary Belly variety is 168 to 170 days, the Pink Lady variety ripens in 226-227 days, and the Fuji variety ripens in 172-180 days. From the same winter varieties, the Jeromin variety ripened in 149-150 days.

It was also observed in the Rosmarin bely variety, which is distinguished by the shortest ripening period among the winter varieties suitable for consumption and processing. Due to the early ripening of Renet Simirenko and Farangiz apple varieties, it was observed that the size of the fruits is smaller than the total number of the harvest compared to other varieties.

Analyzing the productivity indicators of winter varieties, the highest productivity index of Rosemary Bely variety, which is the average for the year, showed a high productivity indicator, and an average of 51.9 tons was obtained from 1 ha of land. Farangiz and Jeromin varieties of winter apples, which showed low productivity compared to other varieties, had the most unfit for storage and processing apples in relation to the total yield. In particular, the yield of the Renet Simerenko variety was 44.4 tons, correspondingly, 1.3 tons of apples unsuitable for storage and processing were 2.9% of the total harvest. Similarly, in the Jeromin variety, the yield was 46.2 tons, and 1.5 tons or 3.3% of apples were unfit for storage and processing.

If we analyze it in terms of years, it can be seen that the last year 2021 unfit for storage crop has increased up to 3.1% in Renet Simerenko variety, 3.0% in Farangiz variety, and 3.2% in Jeromin variety. Due to the improper use of these cultivation, soil and climatic conditions, such a poor quality product is grown and storage problems arise.

As a result of the research and analysis of the agrobiological characteristics of apple varieties suitable for drying, it can be concluded as follows:

Rosemary Bely variety can produce high-quality apple fruits suitable for storage and processing. The lowest indicator was recorded in this variety, and the total yield was 51-52 tons, while the low-quality yield was 0.7-0.8 kg, which is 1.3-1.5% of the total yield.

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