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INITIAL EVALUATION OF AGRONOMIC TRAITS IN NEW APPLE VARIETIES

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Abstract:

This article presents data on several characteristics of late foreign apple varieties "Modi," "Liberi," "Jeromin," "Red Paulo," and "Starking Delicious" planted with a spacing of 4x2.5 meters at the Andijan Scientific Experimental Station of the Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev, located in the Izboskan district of Andijan region. The characteristics studied include fruit color, yield, weight of individual fruits, fruit size, marketability, outer skin, fruit stem length, presence of stone cells, seed cavity, and number of seeds, as observed under the climatic conditions of the experimental station.

Keywords. "Modi", "Liberi", "Jerome" "Red Paulo", "Startking Delicious" selection, side selection, abiotic.

Introduction

An average of 43 million tons of apples are grown annually worldwide. The world's leading apple exporters are China, the USA, and the European Union. China is considered the world leader in apple production. Countries with the highest apple yield per hectare are the USA with 37 tons, Turkey and Poland with 28 tons, and China and Iran with 22 tons each. Other countries produce more than 10 tons of apples per hectare.

It is a fact that the apples being produced are only enough to supply 25% of the world's population.

One of the urgent problems today is the study of new apple varieties, their introduction, the development of new varieties based on them, and their implementation in production to provide industry and the world population with high-quality apple fruits.

With the aim of finding practical solutions to such problems, the Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev is located in the Izboskan district of the Andijan region researchers at the Andijan Scientific Experimental Station studied apple fruits to use new varieties as initial source material in breeding.

Materail methods. Many years of research have shown that the apple tree has a number of economically beneficial properties that distinguish it from other fruit crops. Many apple varieties are resistant to winter, drought, heat, fast-growing, high-yielding, and are not demanding of growing conditions. The diversity of species makes it possible to select varieties for almost all soil and climatic conditions of Russia [1]

At the Melitopol experimental station, in irrigated palmetta orchards, the yield on M-IX rootstock in the sixth year after planting was 106.8-138.6 c/ha for the Macintosh, Calville, Dykena, Augustovskoye, and Ukrainskoye varieties; 86.9-95.7 c/ha for the Cox's Orange Pippin, Golden Delicious, and Yandikovskoye varieties; and 62.1-80.7 c/ha for the Borovinka, Red Delicious, Starking, Slava Angliya, and other varieties.[2]

The research was conducted according to the "Method and Program for Studying Varieties of Fruit, Berry, and Nut Plants," developed by the All-Russian Research Institute of Fruit Crop Breeding (Oryol 1999). Biochemical and physiological studies were carried out in accordance with the "Methodology and Program for Testing Varieties of Fruit Crops" (1973) of the Russian Research Institute of Horticulture named after I.V. Michurin. [3]

Several authors have reported on the long-term storability of various apple varieties (with storage losses less than 10.0%). According to their findings, the clones of introduced varieties include Red Delicious (9 months), King David, Jonared (7-8.5 months), Stark Red Gold, and Golden Delicious (7-8 months). Among autumn varieties, Lobo can be stored for 6-7 months, while summer varieties like Melba and Slava Pobeditelyam last 4-6 months. When stored at low temperatures, Renet Simirenko keeps for 5-8 months, Rozmarin Beliy for 5-6.5 months, and Stark for 4-6 months. The winter variety Krimskoye Zimneye, developed at the Crimean Experimental Station, can be stored for up to 10 months. [4]

For experiments, foreign apple varieties "Modiy," "Liberiy," as well as "Jeromin," "Red Paulo," and "Starking Delicious" were planted with a spacing of 4x2.5 meters. The trees' fruits were studied for their color, yield, individual fruit weight, fruit volume, marketability, outer layer, stalk length, presence of stone cells, seed cavity, and number of seeds.

Research results. The duration of fruit ripening in the studied foreign apple varieties begins earlier than in other apple varieties, with the fruit turning red and seed maturation progressing more rapidly compared to other varieties.

Pomological characteristics of apple varieties.

The apical part of the fruit is not divided into segments. The yield of the variety is high, with a marketability of 88.2%. A single fruit produces 8 to 9 seeds. To increase the yield of the Liberty variety, it is recommended to plant the Golden variety as a pollinator.

The fruits of the "Modi" apple variety are large, with a single fruit weighing 175.3 grams. The flesh of the fruit is yellow, juicy, and sweet, a characteristic clearly inherited from the "Galashi" variety. The outer surface of the fruit is bright red, with prominent stone cells visible. The apical part of the fruit is not divided into segments, which can be seen as a trait inherited from the

"Liberty" variety. The variety's yield is high, with a marketability of 79.8%. This variety is self-pollinating. A single fruit produces 6 to 7 seeds, sometimes up to 8.

The "Jeromin" apple variety is considered a clone of the Early Red One variety of US selection. The fruits are large with yellow flesh that is juicy and sweet. The outer surface has a bloom and is dark red in color with clearly visible bright stone cells. The tip of the fruit is divided into segments. The variety has high yield with 76.4% marketability. It reddens well in mountainous and foothill areas, while in lowland areas, the red coloration develops more slowly. To increase the yield of this variety, it is recommended to plant Golden Delicious, Granny Smith, and Gala varieties as pollinators.

Name	Single fruit weight gr	Yield of tons/ha	Fruit volume	Product value %	Outer layer	fruit color	Band length	Granulation	Seed chamber	Number of eggs
Liberty	129.5	10800	Big	**88.2**	smooth	red	average	Available	**5**	**8.4**
Modi	175.3	17800	Big	**76.4**	smooth	red	average	Available	**5**	**6.4**
Geromin	168.1	13500	Big	**79.8**	smooth	red	average	Available	**5**	**7.2**
Paulared	127.4	15200	Big	**87.4**	smooth	red	average	Available	**5**	**8.6**
Starking	181.2	18400	Big	**84.7**	smooth	red	average	Available	**5**	**7.5**

The "Paulored" apple variety is a US breeding variety developed through individual selection. The fruits are large with yellow flesh that is juicy and sweet. The outer surface of the fruit is dark red with distinctly visible bright stone cells. The tip of the fruit is divided into segments. The variety has high yield with 87.4% marketability. It develops good red coloration in mountainous, foothill, and lowland areas A single fruit produces 7 to 8 seeds.

The "Startking delishest" apple variety is considered a clone variety of the "Red delishest" variety of US selection, the fruits are large, the color of the inside of the fruit is yellow, the color on the outer surface of the juicy sweet fruit is dark red, the bright stone cells are clearly visible, the tip of the fruit is divided into pieces. The variety's yield is high, and its marketability is 84.7%. In mountainous and foothill areas, it reddens well, while in lowland areas, the red coloration is slower. To increase the yield of the variety, it is recommended to sow Golden Delicious, Granny Smith, and Gala varieties as pollinators. A single fruit produces 7 to 8 seeds.

Conclusion

Based on the results of economic and biological observations of new apple varieties, the following conclusions were made.

The Liberty apple variety reddens well in the conditions of the Andijan region, and the fruit retains its natural state well when stored for a long time. The variety's resistance to abiotic (heat and drought) factors was determined.

The Modi apple variety adapted to the conditions of the Andijan region and demonstrated its resistance to abiotic factors (heat and drought). Another characteristic of the variety was its full red color, which led to a high yield with minimal pest damage.

The "Startking delishest" apple variety has high yields, fruits have a uniform red color even in foothill and lowland areas with low shedding, and high storability.

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