

## PROSPECTS FOR DEVELOPMENT AND FEATURES OF APPLE PRODUCTION IN KAZAKHSTAN

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**Abstract.** At present in Kazakhstan the rates of development of the fruit growing industry and the existing assortment do not fully meet the modern requirements of intensification. In Kazakhstan, the apple tree occupies a leading place among industrial plantings. The increase in the gross production of fruits, berries and grapes should be carried out not only by expanding the area of plantations, but also by intensifying the industry on the basis of a correct varietal policy, scientifically substantiated distribution of species and varieties, modern technologies, financial and technical support of the industry.

**Keywords:** apple fruit production, yield, gross harvest, intensive gardening, introduced varieties, import dependence, dwarf and semi-dwarf rootstocks, scientifically substantiated distribution of varieties.

Kazakhstan, due to the favorable combination of soil and climatic conditions, is the most important region for the development of commercial horticulture and viticulture. Gardening is an important branch of the national economy, which provides the population with high-vitamin products, which

has a positive effect on human health and longevity. The condition for strengthening the food security of the Republic of Kazakhstan is to provide the population of the country with locally produced products. Unique genetic resources of plant agrobiodiversity of world importance are concentrated in Kazakhstan. They include 194 plant species that determine the genetic potential of 24 crops. A number of them are of significant value both for the development of agriculture and for expanding the export potential. Fruit agrobiodiversity and, above all, the wild apple tree, which is highly resistant to many diseases, high frost resistance, and wide ecological plasticity, has received worldwide recognition. The south- and south-eastern region of Kazakhstan is the center of origin of the apple tree culture, where exceptionally favorable conditions have developed for its cultivation. The apple tree is one of the widely grown fruit crops in the temperate zones of both hemispheres. The apple tree is commercially the most important fruit and the fourth most widely produced fruit in the world after banana, orange and grapes. The wide distribution and popularity of the culture is explained by its valuable taste, nutritional qualities, as well as economic and biological features. One of the branches of agricultural production, in which the needs of the population are not fully met, is fruit growing and viticulture. Consumption of fruit and viticulture products by the population determines the quality of nutrition. FAO has included the main fruit crop, the apple tree, in the list of crops that determine the food security of the state. Currently, among a wide variety of fruit crops, the apple tree is one of the most common not only in our Republic of Kazakhstan, but also in other countries of the world. In the general structure of pome and stone fruit plantations in Kazakhstan, the apple tree prevails - the area of plantations is 31,6 thousand hectares. In Kazakhstan, the apple tree occupies a leading place among industrial plantations, and it is also grown in large quantities in home gardens. Apple fruits are an essential food item in the human diet. With a relatively low energy value, apples are a source of vitamins, organic acids and mineral salts, aromatic substances, fiber and easily digestible carbohydrates, which play an important physiological role in metabolism. Their consumption should be uniform throughout the year. In modern conditions of human life and activity, the importance of fruits and berries has increased, since they are the most effective means of increasing the activity of nutrition in the fight against adverse factors that intensively affect a person. These foods are valuable because they contain carbohydrates, proteins, fats, vitamins, enzymes, hormones, minerals and other substances. Fruit production in the world is 86,14 million tons per year, and the area occupied by orchards is 4904,3 thousand hectares. The leaders in the production of apple fruits are China - 39233,4 thousand tons / year (2071,5 thousand hectares), USA - 4652,5 thousand tons (117,8 thousand hectares), Poland - 3999, 5 thousand tons (161,8 thousand ha). These leading countries have a very developed nursery system with the introduction of biotechnology and intensive horticulture, as well as mechanization and the production of chemicals. In the neighboring country, the Russian Federation, apple orchards make up 207,3 thousand hectares, which is 22% more than the area of Poland, and the gross harvest is 1859,4 thousand tons. Kazakhstan is increasing the production of fruits and berries. However, domestic production does not cover the country's needs for fruits and berries. In Kazakhstan, on average, 197,2 thousand tons of apples are produced, the area of orchards is about 32,0 thousand hectares. However, in Russia, as well as in Kazakhstan, intensive horticulture and the production of high-quality, healthy seedlings on a large scale are not developed, and there are no local varieties suitable for intensive horticulture. In the 90s of the last century, the area occupied by the apple tree culture decreased sharply, but recently, the plantations have been actively restored. However, the share of domestic varieties in industrial plantings is small, the main part of plantings are introduced varieties Golden Delicious and Starkrimson, new introduced apple varieties included in the State Register are poorly represented, and even more so new Kazakhstani varieties that have passed the State variety testing. The reason for the reduction in the area occupied by local varieties of apple trees is the import dependence of our agricultural producers, who are forced to import planting material from abroad. The country's annual demand for high-quality virus-free planting material for fruit crops for intensive horticulture is 7,0 million pieces, and 80% of the required amount is currently covered by imports.

In the message of the President of the Republic Tokayev K.K. "Constructive public dialogue is the basis of stability and prosperity of Kazakhstan" was told to the people of Kazakhstan: "Agriculture is our main resource, but it is far from being fully used. We have significant potential for the production of organic and environmentally friendly products that are in demand not only in the country, but also abroad." The tasks of the State Program for the Development of the Agroindustrial Complex of the Republic of Kazakhstan for 2017-2021 include ensuring the transfer of technologies and increasing the level of technical equipment and intensification of production in the agroindustrial complex. At present, in Kazakhstan, the pace of development of the fruit growing

industry and the existing assortment do not fully meet the modern requirements of intensification. The share of imports of fruit products is steadily increasing, this trend may lead to the country's dependence on imports. At the same time, imported products entering the domestic food market do not always meet the requirements of quality, shelf life and health safety. The main suppliers are such countries as: China (23 million tons), USA (4,5 million tons), Poland (3 million tons), Turkey (2,3 million tons), Italy (2,1 million . tons), France (2,1 million tons), Germany (2 million tons). Fruits and berries are an indispensable source of natural vitamins, minerals, antioxidants, have healing and preventive properties. However, at present, the population of Kazakhstan is experiencing an acute shortage of fresh fruits and berries. With a scientifically based human need for fruits and berries of about 100-120 kg per year, the real consumption in Kazakhstan is 40-45 kg, and 35 kg of them are imported products and only 1/3 of them (10-15 kg) are products domestic manufacturers. In foreign countries, fruit consumption is much higher. Thus, in the USA 127 kg of fruits are consumed per capita, France - 135 kg, Germany - 126 kg, Italy - 187 kg. In the United States alone, the wholesale value of the apple harvest is nearly \$4 billion. Among the many varieties, clear favorites stand out: consumers around the world prefer the crisp, sour green Granny Smith apples or the sweet and soft red Red Delicious fruits. At present, the main goal in Kazakhstan is to provide the population of the country with high-quality fruit and berry products of its own production. In Kazakhstan, most of the old apple plantations are in disrepair. The main reason is the lack of a complex of agrotechnical measures and elementary tree care, including pruning. As a result, the average yield throughout the country does not exceed 4-6 t/ha, which is 10-15 times less than in European countries. At the end of 2019, Kazakhstan can produce about 300 000 tons of apples worth 54 billion tenge, with a total market potential of more than 80 billion. Last year, Kazakh gardeners managed to grow 222 000 tons of this fruit, according to the reports of the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan. The main volume of apples was harvested by individual entrepreneurs and farms - more than 138,3 thousand tons: 62,5 thousand tons were given by households and 21,6 thousand tons - by agricultural enterprises. In other words, the main volume of Kazakhstani apples is grown by small farms. There are more than 31,6 thousand hectares of land under apple orchards in Kazakhstan. Kazakhstan began to grow more apples for several global reasons. Firstly, demand is growing, secondly, imports still make up a significant part of this industry, and thirdly, the state has begun to support domestic producers by subsidizing loan rates and returning part of production costs. On average, the state in one way or another helps gardeners to compensate for about 15% of production infrastructure costs. Favorable soil and climatic conditions of the south-east of Kazakhstan make it possible to obtain high-quality apple fruits. According to the state program «Agribusiness 2020», the laying and cultivation of intensive orchards is included in the list of priority investment areas for the allocation of investment subsidies. Horticulture today is in search of the most effective solutions, so the industry is massively switching to intensive orchards, which begin to produce apples already in the first or second year after planting.

In the Almaty region of Kazakhstan, the area of intensive apple orchards has reached 2222 hectares, in 2022 the figure is planned to be increased to 2600 hectares. At the same time, the region expects to receive 18,9 thousand tons of crops in 2020, and more than 31 thousand tons in 2022. As noted in the regional department of agriculture, today the area of orchards in the region is 996,1 hectares, of which 402,8 hectares are pome fruits, 431,2 are stone fruits, 161 hectares are berries, 1 ha are nuts and 0.08 ha are grape. As for the famous Aport apple variety, in 2012-2018, 214 economic entities of the region that planted apple trees of this variety on 728,8 hectares received 670,4 million tenge of subsidies from the local budget. Thanks to this, the area of orchards with "Aport" has reached 2000 hectares. The number of seedlings is 416 thousand pieces. Varieties such as Fuji, Golden Delicious, Gala, Granny Smith, Starkrimson, Idared, Golden Superb and others are grown in intensive apple orchards. Joint work and exchange of experience on the use of modern apple technologies, planting material is carried out with specialists from Italy, Germany, Serbia, Poland, Holland, and Turkey.

According to the Committee on Statistics, in 2018 Kazakhstan imported almost 121 thousand tons of apples worth \$56,2 million, mainly from China and Poland. At the same time, the export of apples in 2018 more than doubled compared to the previous year, but remained at an insignificant level - only 4 thousand tons for \$1,3 million. Thus, the approximate capacity of the "apple" market in Kazakhstan is in general about 450 thousand tons and can potentially be estimated at 81 billion tenge. The natural conditions of the growing season in the south and southeast of Kazakhstan make it possible to grow crops of high quality fruits, both for fresh consumption and for processing. But,

at the same time, the sharp continentality of the climate in the autumn-winter period often leads to freezing of plants, and at the end of spring (during flowering) as a result of return frosts, to the death of flowers and, ultimately, to the loss of a significant part of the crop, which is very strongly affects the economy of small farms specialized in fruit growing.

The industrial horticulture of Kazakhstan needs a radical increase in its profitability and competitiveness both in the domestic and in the world fruit market. Domestic and world experience shows that the solution of this problem in modern conditions is possible only through the creation of early-growing, highly productive and consistently fruitful orchards. Despite significant imports of fruit products, the population's need for it is not fully satisfied. The most important factor in achieving lost food security is import substitution, that is, partial or complete replacement of apple imports with domestic ones. For import substitution of fruits in the agricultural market, it is necessary to increase the gross harvest of fruits, which can be solved by using new technologies, the transition of this business to sustainable development. Intensive horticulture provides a high yield of products per unit area of plantations, a quick return on investment, an active variety change, which determines a favorable ecological and, in particular, phytopathogenic situation of the territory and an increase in the quality of fruit products. The main condition for the successful development of Kazakhstan fruit growing is the scientifically based placement of commercial plantations in natural areas, taking into account all socio-economic issues (material and technical capabilities, labor resources, storage and processing enterprises, sales markets, etc.), and scientifically based zoning territories for different breeds and varieties. Modern industrial horticulture requires considerable investment, besides, horticulture, like the agricultural business, has its own share of risk, and this primarily concerns weather conditions, a sudden drought, hurricane or severe frost can destroy the crop and the plantations themselves. But with the use of modern technologies, the percentage of risk can be reduced, the same drip irrigation will avoid the loss of seedlings and crops from sudden drought, and overhead irrigation will reduce losses from sudden spring frosts. Another very important point of the apple business is the payback period of investments, here the technology of growing an apple orchard plays an important role.

Kazakhstan exports very few apples compared to how much it imports, but there is serious progress and potential in export growth. Thus, the current state of horticulture in Kazakhstan, so far, lags behind in its development from many foreign countries. Accordingly, our republic needs the intensification of horticulture. It is necessary to have a network of specialized nurseries for growing healthy planting material, which must meet the basic requirements and quality standards. To pay more attention to the concentration of horticulture in specialized enterprises, to speed up the uprooting of old unproductive plantations and to increase the establishment of intensive orchards on dwarf and semi-dwarf rootstocks. To provide the farms with specialized gardening equipment, modern fruit storage facilities and to strengthen state support for the establishment and maintenance of perennial plantings. The increase in the gross production of fruits, berries and grapes should be carried out not only by expanding the planting area, but also by intensifying the industry based on the correct variety policy, scientifically based distribution of breeds and varieties, modern technologies, financial and technical support for the industry.

#### **List of used literature:**

1. State program for the development of the agro-industrial complex of the Republic of Kazakhstan for 2017 - 2021. Approved July 12, 2018 No. 423. <https://primeminister.kz/ru> November 05, 2019.
2. Dzhangaliev A.D., Salova T.M., Turekhanova R.M. Wild fruit plants of Kazakhstan. - Almaty, 2001.
3. Ulyanova K. S., Ulyanova A. P. Apples - garden, honey, crumbly // Young scientist. - 2019. - No. 6. - p. 59
4. Gudkovsky, V.A. Modern apple orchards with a high planting density in Western Europe // Horticulture and viticulture. - 1999. - No. 5-6. - S. 19-22.
5. Doroshenko, T.N. Fruit growing with the basics of ecology. - Krasnodar, 2002. - 274 p.

6. Krasova, N.G., Galasheva, A.M. Economic efficiency of cultivation of new varieties of apple trees grown on low-growing intercalated rootstocks / Inf. leaflet No. 53-001-76. - Eagle: TSNTI, 2006. - 3 p.