Stone Fruit Production in Bulgaria - Problems and Challenges

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Abstract

Fresh fruits are nutritionally valuable and are a major part of consumers' daily diet. They are used both for fresh consumption and for processing in the food industry. The production of stone fruits in Bulgaria is specialized in different regions of the country, but over the years, some sector-specific problems and challenges have been observed, which are of interest. The aim of this paper is to present and analyze the problems, challenges and possible solutions which appear in front of the sector connected with the production of fresh stone fruits.

Keywords: stone fruits, production, problems and challenges in the sector

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Introduction

The genus Prunus includes various stone fruits: cherries (*Prunus avium L.*), sour cherries (*Prunus cerasus L.*), plums (*Prunus domestica*), peaches (*Prunus persica*), nectarines (*Prunus persica var. nucipersica*) and apricots (*Prunus armeniaca*). Stone fruits (cherry, sour cherry, plum, peach, nectarine and apricot) are real, simple fruits, since they are formed only by the pistil. A pistil is an apocarpen formed by the adhesion of only one fecundity. On the abdominal side of the fruit is located an abdominal seam, representing the place of adhesion of the edges of the fruit. Stone fruits are real, since only the pistil of the flower participates in their formation. Inside the fruit, instead of a seed nest, there is a single-chamber pit, in which the seed (kernel) is located (Vasilev et al., 1982; Mihailov, 2006; Donchev et al., 2011; Manganaris et al., 2020).

Cherries, sour cherries, plums, peaches and apricots are valuable fruit species, their fruits are used both for fresh consumption and for drying (Szymczak et al., 1998; Igual et al., 2012) for freezing, processing and producing: fruit sugar cans (jams, jams, marmalades and jellies); fruit cans (compotes); fruit juices, nectars and mousses; addition to pastry-sugar and confectionery; production of high-alcohol beverages (brandy, liqueurs, etc.), etc. (Lavinski, 2005; Mihailov, 2006).

In recent years, there has been an increase in the production and consumption of stone fruits, and this is probably due to consumer awareness of their nutritional value and their beneficial effect on tone and health, as they are rich in useful substances polyphenols (anthocyanins and hydroxy acids), sugars, vitamins, mineral substances, etc. (Blando et al., 2019; Manganaris et al., 2020).

The main producers of stone fruits worldwide are: cherries - Turkey, USA, China (FAO, 2023), sour cherries - Russia, Turkey and Ukraine (Money.bg, 2018; FAO, 2023), plums - China, Romania, USA and Serbia (Agry.bg, 2018; FAO, 2023; Ricardo-Rodrigues et al., 2023), peaches and nectarines - China, Spain and Italy, apricots - Turkey, Uzbekistan and Iran. In recent decades, Turkey has been among the world's first producers of fresh and dried apricots (FAO, 2023). In the EU, the largest producers of stone fruits are: cherries – Italy, Spain and Greece, sour cherries – Poland and Hungary, plums – Romania, France and Italy, peaches and nectarines – Spain, Italy and Greece, apricots – France, Italy and Spain (Ivanova et al., 2017; FAO, 2023, Cirillo et al., 2023).

The purpose of the present study is to make a short and reasoned analysis of the state in the agricultural sector and more specifically the production of stone fruits in Bulgaria during the period 2019-2021, to present the state and outline the existing problems and challenges. In this regard, the production of stone fruits in Bulgaria, the import and export of stone fruits on the territory of our country is presented and the existing problems and challenges facing the sector are outlined. The

article is based on a study of a large number of research sources clarifying the relationship between the state, the production of stone fruits, the existing problems and challenges facing producers in our country. The accepted thesis is that the production of stone fruits is directly related to the requirements laid down in the regulatory framework, harvesting, renewal and maintenance of stone fruit plantations.

1. Analysis of the dynamics and development of stone fruit production in Bulgaria

The European policy that plays an important role in supporting and developing Bulgarian agriculture is the Common Agricultural Policy of the European Union. The positive point is that, through its application, European aid is granted in the agricultural sector (Natsionalna strategia za ustoichivo razvitie na zemedelieto v Balgaria 2014-2020, 2013). The European regional policy envisages supporting the sustainable use of natural resources in a way that protects nature and improves the standard of living of the population in rural areas. Undoubtedly, it is one of the most important branches of our economy is Bulgarian agriculture. The agricultural sector continues to play an important role in the national economy and characterizes to a greater extent the overall state of the country. Since 2007, Bulgaria and all farmers have been placed in a different situation regarding the development of agriculture. In front of our country, as a member of the EU, there are new challenges for Bulgarian agriculture. Therefore, if until our accession to the EU the main factors for the development of agriculture are internal, then after our accession as a member of the EU, external factors such as trade, demographic changes, rural areas, regional development, subsidies, etc., also play an important role on the development of the Bulgarian agricultural sector (Krasteva, 2017).

In Bulgaria there are favorable conditions for the cultivation of different fruit species, and over the years there have been separate fruit growing regions, which are approximately in the same areas, and only the total area of plantations varying. The state of fruit growing in the country depends on many natural and socio-economic factors, including a shortage of financial resources for consolidation and modernization of production, as well as obsolescence of existing plantations and insufficient rates of creation of new ones (Kabadzhova, 2022).

On the territory of our country the soil and climatic conditions are favorable for growing and producing high quality cherries, sour cherries, plums, peaches, nectarines and apricots competitive on both domestic and foreign markets. The main regions in Bulgaria where cherries grow are North Central, Southwest, Southeast and Northwest. The average cherry yields in these regions from the 2021 harvest are respectively – 5 317 kg/ha, 5 111 kg/ha, 5 083 kg/ha, 3 566 kg/ha. The production of cherries in Bulgaria is second after the production of plums and dzanks. The production of sour cherries in Bulgaria is concentrated in the North Central, Northwest, Southeast and South-Central regions. In the presented regions, the average sour cherry yield from the 2022 harvest is respectively – 5 537 kg/ha, 4 784 kg/ha, 4 000 kg/ha and 3 704 kg/ha. The production of sour cherries in Bulgaria occupies fifth place after plums, peaches, cherries, peaches and nectarines, apricots and zarzali. The production of plums and dzanks in Bulgaria is concentrated in the South Central, South-East, North Central and North-East regions. In the presented regions, the average yield of plums and dzanks from the 2021 harvest is respectively – 7 126 kg/ha, 6 580 kg/ha, 6 000 kg/ha and 5 142 kg/ha. The production of plums and dzanks in Bulgaria occupies the first place among the produced seed fruits, stone fruits, strawberries and walnut fruits. The production of peaches and nectarines is concentrated in the following areas: South-East, North-Central, North-East and South-West. In the presented regions, the average yield of peaches from the 2021 harvest is 10 537 kg/ha, 8 815 kg/ha, 7 699 kg/ha and 7 535 kg/ha respectively. The concentration of apricot and zarzeli production in Bulgaria is localized in the following regions: North Central, South-East, North-East and North-West. In the presented regions the average yield of apricots from the 2021 harvest is respectively – 6 517 kg/ha, 6 444 kg/ha, 4 975 kg/ha and 4 609 kg/ha (Proizvodstvo na plodove v Balgaria – rekolta 2022; Slavova et al., 2022).

In 2021, 202,579 tons of fruit were produced on farms, which is 13,6% less on an annual basis. Comparing with 2020, an increase in production is reported in plums and dzanks – by 6,8%, and the production of other fruits decreased by 53% (apricots and zarzali). In 2021, 226,118 tons of fruit were produced in the country, which is 11,6% more on an annual basis. The largest share of the total fruit production during the year is formed by plums and dzanks – 28,8%, followed by cherries – 23,3% and apples – 19,5% (Agraren doklad, 2021; Agraren doklad, 2022).

Compared to 2020, in 2021 there is a significant increase in apricot production more than doubled. Significantly larger are the harvested quantities of peaches and nectarines, plums and dzanks – by 958 and 5,100 tons. At the same time, sour cherry production decreased by 395 tones and cherry production was higher than reported in the previous 2020 and lower than in 2019 (Table 1).

Table 1. Production of stone fruits from harvest 2019, 2020 and 2021

	Stone fruit production from harvest 2019, 2020, 2021						
№	Fruit crops	Average yield (kg/ha)			Production (tons)		
		2019	2020	2021	2019	2020	2021
1	Cherries	5 072	4 922	4 893	54 960	52 326	52615
2.	Sour Cherrie	3 875	4 368	3 731	5 146	4 809	4 414
3.	Plums	7 009	7 002	7 021	56 192	60 024	65 124
4.	Apricots and greens	6 957	5 177	6 756	20 244	9 516	20 701
5.	Peaches and nectarines	10 541	7 474	8 117	33 878	20 740	21 698

Source: Godishen doklad za sastojanieto i razvitieto na zemedelieto (Agraren doklad' 2020; Agraren doklad' 2021; Agraren doklad' 2022), MZHG, otdel Agrostatistika

The leading place in fruit production is occupied by the Southeastern and Southern Central regions, forming 26,5% and 23,3% respectively of the total production for 2021. In the Southeastern region is concentrated the production of peaches (65,5%) and cherries (41%), and in the South-Central region are produced the highest amount of sour cherries (29,8%). In the North Central region, 84,7% of apricots in the country and 25,2% of plums and dzanks were produced. In 2021, there was an increase in the average yields of apricots and zarzali by 117,5%, plums and dzanks by 8,5%, followed by peaches and nectarines by 4,6% and cherries by 0,6% (Agraren Doklad, 2022).

The average yields of peaches, nectarines and sour cherries for the 2022 harvest are higher than in the 2021 harvest, respectively by 18% and 3%. Lower average yields were found in plums and apricots production respectively with 14% and 8%, and in cherries they were not changed. A total of 97% of the produced fruits – harvest '2022 are realized, the highest share of production intended for direct sales, including export and commercially - 52%, and the quantities for processing are 41%. The share of production for own consumption in the farm is the lowest - 7% (Proizvodstvo na plodove v Balgaria – rekolta, 2022; Situatia na pazara na presni plodove I zelenchuzi v Balgaria, 2023).

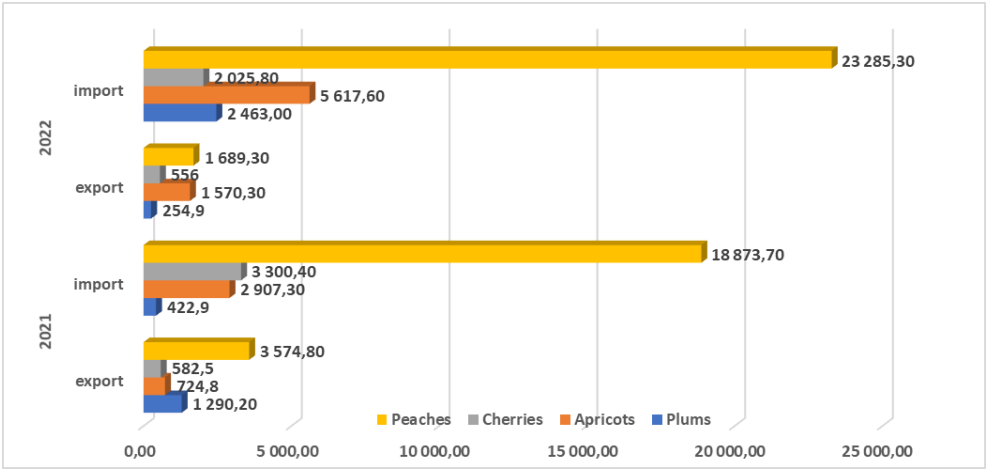
The main reasons for the reported dynamics after 2019 (the lower yield of some stone fruits) are due to the low productivity of the orchards, as well as the poor condition of the plantations. The destroyed hydromeliorative system leads to a strong dependence of the production of Bulgarian stone fruits on climatic factors and to unsustainable production over the years. Fluctuations in stone fruit production are due to climate in the different years. This brings to the fore the problem of irrigation and the almost destroyed irrigation system on the territory of our country. The dependence of the manufactured product on the specific weather conditions also results from this and brings to a great extent dependence and uncertainty among the producers. This raises many

questions, related to the analysis and management of risk in stone fruit production, which is related both to preventive measures to combat hail, frost, drought and other adverse climatic events, and to the insurance of production.

On the other hand, the reasons for the changes and the significant reduction in the quantities of stone fruits produced are related to the need of investment and production costs. Reduced returns due to productivity problems, finding the best prices, market access and providing the production process with the necessary workforce leads to an unsatisfactory ratio between gross revenues and production costs, which makes the specialized production of stone fruits unattractive. The interest in recent years has been supported by the possibilities for coupled support as well as by the access to use investment funds under the Rural Development Program (RDP), which should be aimed at increasing the results of these measures so as to increase the sustainability and appropriateness of the implemented policy (Doklad – Analiz na sastojanieto na selskoto stopanstvo i HVP, 2019).

2. Analysis of the development of import and export of stone fruits in Bulgaria

A significant part of the stone fruits produced in Bulgaria are intended for realization and export outside the country. In this context, in order to provide consumers with a quality product, it is necessary to comply with the requirements for manufacturers, traders and economic operators. Studies have shown that the consumption of peaches from import is significantly reduced worldwide, mainly due to consumer dissatisfaction, according to which the commercially available fruits are tasteless and with not typical consistency, and the main reason for this is that the fruits are harvested before they are fully ripen in order to preserve them for a longer time during the following logistics activities (Minas et al., 2018).



Source: Own research

Figure 1. Import and export of stone fruit, in tones, in Bulgaria in the period 2021-2022

In the period 2021-2022, the quantity in tones of imported stone fruits are higher than that of exported fruits native production (Figure 1.). The highest share of peaches exported from Bulgaria is in the period 2021-2022, followed by apricots, cherries and plums, as they are intended mainly for the market of Romania, Belarus, Italy, Spain, Poland and the Netherlands. The import of stone fruits in Bulgaria is the highest for peaches, next place is occupied by apricots, cherry and sour cherries, as imported fruits are from Greece, Turkey, North Macedonia, Germany and Spain. The largest suppliers outside Europe are Turkey, South Africa and Chile. Turkey is main importer of fresh cherries into the EU, even in June and July. South Africa is a major supplier of plums, and Chile exports mainly plums and cherries (Spravka "Vnos/iznos na osnovni presni plodove i zelenchuzi v Balgaria prez perioda 2021 – 2023 po producti i po strani"; Balgarska stopanska

kamara, 2023; Situaziata na pazara na presni plodove i zelenchuzi v Balgaria, 2023; Beltramo et al., 2023).

In 2021, the production, in tones, of stone fruits, excluding cherries and sour cherries, is higher than in 2020 (Table 1.). The Bulgarian average annual export of stone fruits in tons is lower than the import of these fruits. This is evidence of significant changes in production, logistics, trade and traditional perceptions of the sector. It is faced with various challenges related to the entry of new varieties and species, the opening of new markets, changes in consumer behavior and preferences, etc. Therefore, a critical analysis of the problems in the fruit growing sector is needed in order to take out specific activities aimed at developing and restoring traditions in the cultivation and production of quality stone fruits intended for consumers in our country and abroad.

The world fruit trade is changing faster than many market participants can react. It is not only growing at an incredible pace, but its structure is also constantly changing. The trade with fresh fruit is becoming increasingly globalized. This radically changes production, logistics and traditional notions of the sector. It faces challenges related to the opening of new markets, the entry of new products, changes in consumer behavior. New technologies and Internet, are changing not only fruit production, which is becoming more and more automated and efficient. They are also changing the way products are marketed. Distribution channels are also changing. Online sales of groceries, including fresh fruit, are growing in different countries. One of the main drivers of changes in the demand for fruit in the last decade is the growing interest of increasingly large segments of society in the origin, quality, way of growing of fresh fruit, their properties and their impact on the human organism (InteliAgro, 2019).

Against the background of global trends, the situation in Bulgaria is as follows: on the one hand, the demand in the country follows the mentioned changes, and on the other hand, the supply lags drastically behind the needs of the market, and this is evident in the declining exports and rising prices on the domestic market. A likely reason for this is the producer support policy, which focuses their attention solely on subsidies and not on demand. This is the main problem and the main mistake, and here the following question arises: what kind of subsidies should we talk about in a world where the fruit trade is increasingly dominated by countries where this word *"subsidies"* is unknown.

Direct sales as a leading form of marketing stone fruit provide many advantages over farmers and consumers, namely direct contact between producers and consumers, which plays a significant role in the origin and quality of fresh fruit, there are lower prices due to the restriction of intermediaries in distribution. Consumers can get more complete information about their consumer preferences, variety and tastes. In addition, consumers have access to a wide assortment, fresh and quality products at affordable prices. One of the opportunities for direct sales is farmers' markets, and is expected their number to increase, as specialized farmers' markets are increasingly organized and opened, where fresh fruit is offered. Farmers' markets are becoming more and more popular because they bring economic, social and environmental benefits both to the local population and to the development of small settlements. They contribute simultaneously to both increasing the standard of life, as well as for the awareness and rigor of consumers to quality food products.

The main challenges in front production of stone fruits can be summarized in the following directions:

- The growing global market for fresh stone fruits provides excellent prospects for Bulgarian producers in this area;
- Stone fruits have an export potential that can be exploited if it is invest in growing new varieties;
- Modernization of the variety structure of part of the fruit plantations, including new Bulgarian species;

- The problem of manpower can be solved by increasing exports of fresh stone fruit, the prices of which will be significantly higher than the buying-in price of the fruit for processing in the country;
- Bringing together small producers in order to be able to meet the European requirements, to use the programs, to invest in new modern equipment, to produce more and better-quality products that will find better realization, and hence higher profit for farmers;
- Creation of cross-border cooperation through clusters or other types of organizations integrating the production of countries in different regions. This is another option for small stone fruit producers to be equal on the market is to associate, and associations must have specific privileges;
- Provision of additional specific state support for quality fruit production and of new state aid to the sector, including to the stone fruit subsector;
- Providing national and/or European funding for the purchase of refrigeration equipment for the sector of fresh fruits.

The main recommendations that can be brought out for further development of the stone fruit production sector are as follows:

- It is necessary to encourage and raise awareness of producers about the possibilities of creating sustainable growth, employment and income generation from the development of stone fruit production in the country.;
- Allocate European and national funds to introduce innovation, research and technology in the sector, including expanding the supply of fresh stone fruits in consumer packages.;
- Granting tax preferences to rural start-ups to attract skilled workers.;
- To allocate funds from the state budget for promotion and participation in specialized international exhibitions and fairs of stone fruits producers and related products.

Conclusion

The studies made, the analysis of the data and the results of the scientific research conducted on the production, import, export and sale of fresh stone fruits in Bulgaria give us the following more important conclusions and summaries:

- On the territory of Bulgaria, the soil and climatic conditions are favorable for growing and producing high quality stone fruits (cherries, sour cherries, plums, peaches, nectarines and apricots) competitive on both domestic and foreign markets. The main regions in Bulgaria where stone fruits are grown are: *cherries* - North Central, Southwest, Southeast and Northwest; *sour cherries* - North Central, North-West, South-East and South-Central regions; *plums and dzhankas* - South Central, South-East, North Central and North-East regions; *peaches and nectarines* - South-East, North-Central, North-East and South-West; *apricots and zarzali* - North Central, South-East, North-East and North-West.;
- The leading problems in the production of stone fruits are related to insufficient subsidies, lack of state support and tax incentives, high share of manual labor, shortage of quality labor, low level of mechanization and automation of processes, due to lack of funds for investments in new technologies and poorly developed refrigeration logistic and processing bases on the territory of our country.;
- Existing and deepening irrigation problems (poor irrigation infrastructure, insufficient irrigation equipment, high water price, etc.) have a significant negative impact on the efficiency production of quality stone fruit.;

- Farmers prefer direct sales as a form of realization of their production because they build trust with consumers and receive feedback of information, which is the basis for a longer relationship between them. Other ways of realization of fresh stone fruit production such as: intermediary companies, trade network, open markets, and other channels for successful sale of fresh stone fruits are also used. The main aim is to offer local, authentic, traditional varieties of fresh stone fruit to support local producers, to continue the preservation of Bulgarian traditions in the production and export of stone fruit varieties with high quality.

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