

# ANALYSIS OF MARKET OPPORTUNITIES FOR RASPBERRY PRODUCTION IN THE REPUBLIC OF NORTH MACEDONIA



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## ABSTRACT

The purpose of the research in this paper is to analyze the production of raspberries in Republic of N. Macedonia and to perceive its place on the world market of raspberries, as well as to analyze the market opportunities for raspberry production in Republic of N. Macedonia.

The results of the research show that Russia occupies 19% of world raspberry production for 2018 while Mexico occupies 15% of total raspberry production and Serbia occupies 15% of total raspberry production for 2018, i.e., it is the third largest producer in the world. The production of raspberries worldwide has increased by 7% in 2018 compared to 2017, while compared to 2010 this production worldwide has increased by 40%.

Republic of N. Macedonia with its 33rd place occupies 0.03% of the total world production of raspberries in 2018 from a total of 45 countries. But despite the small share in world raspberry production in 2018, Republic of N. Macedonia records a drastic increase (by 96%) compared to 2010, while compared to 2017 it increased by 25%. Republic of N. Macedonia has the necessary conditions for the production of raspberries, but still this branch is not fully developed.

## 1. INTRODUCTION

Rich yield, unlimited sales, high purchase prices and European earnings make growing raspberries a profitable agribusiness.

Regarding the ecological conditions, raspberry is a very specific crop and therefore, before deciding to raise a plantation, it is necessary to analyze the ecological conditions that largely determine the success of the plantations. The best locations for raspberry plantations are in the beech zone, on hilly and mountainous areas and at an altitude of 300 to 1000 m. The soil conditions of the location are extremely important for the successful cultivation of the plantations. This crop gives the best results on deep, loose, permeable, slightly acidic soils with a pH of 5.5 to 6.5, and soils with a humus content of 3 to 5%. Raspberries respond particularly poorly to shallow, light, dry, calcareous, stony, highly acidic, alkaline, heavy and swampy soils.

The best conditions for raspberries production are areas with temperate-continental climate, in moderately humid and moderately warm areas without large temperature fluctuations. Of the climatic elements of special importance are light, heat, precipitation and wind. Raspberries do not tolerate shady places, but they do not tolerate

places exposed to a lot of sun. During the winter, raspberry shoots freeze at temperatures below -18 ° C, especially if such low temperatures occur on frost. Raspberries do not tolerate dry conditions. They thrive in areas with annual rainfall of 700 to 1000 mm, half of which are during the growing season. If there is not enough rainfall in the plantations, irrigation should be provided. Raspberries also do not tolerate very windy locations.

Raspberry is one of the most profitable fruit products. The economic importance of its production is reflected in the high level of merchandising, competitiveness and increasing demand for frozen raspberries in the market of the European Union [1]. (Kljajić N. et. all., 2017, pp.59).

Raspberries represent a highly sought-after commodity in the world market. Apart from being a delicious fruit that can be consumed without any further processing, raspberries are an essential input when it comes to the production of juices, jams, extracts and similar food and beverages (Stojković et. all., 2020, pp. 956).

In the Republic of North Macedonia, hilly and mountainous areas offer a huge untapped potential for growing raspberries.

Raspberries belong to the red varieties of *Rubus* fruit with a red color that are grown in Europe (European red raspberry), North America (American variety) and many different varieties and varieties in Asia, i.e., the cultivation of *R. hirsute* in China. Red raspberries are the fourth most important fruit product in the world.

"Vilamet" and "Miker" are the most common varieties of raspberries in Republic of North Macedonia. The first variety is characterized by high fertility and large fruits, while the variety "mike" has a higher yield than "vilamet" and matures a few days after it. It is widespread in the forests of Europe, Asia and North America, and is also present in our country. It is a profitable, economically important fruit crop, with early, abundant and regular fruiting. But despite all the advantages, the production of raspberries in the world is in short supply and does not meet the needs of the people.

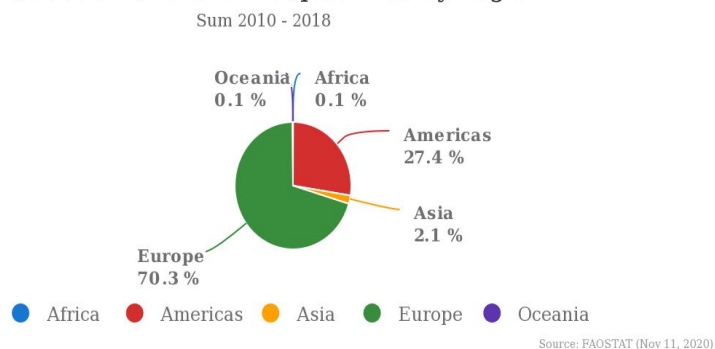
## 2. MATERIALS AND METHODS

In this research are used methods which can be considered a way to arrive at scientific data on the phenomena in the society. For the purposes of this study, have been used several scientific methods: The method of explanation, descriptive methods, the methods of concretization, generalization and comparison of the data, inductive and deductive method and methods of analysis and synthesis. Statistical method is used whereby the statistical processing of the obtained data from the research is interpreted, then analyzed, based on which appropriate conclusions were drawn. Multiple sources were used for the research in this paper. Current state and trends in the production of raspberry in Republic of North Macedonia and in the world are perceived on the basis of statistical data downloaded from websites and available statistical publications.

## 3. RESULTS AND DISCUSSIONS

Demand for raspberries and blackberries has risen sharply in Europe and North America in recent years. In the Western countries, raspberries are considered a luxury product.

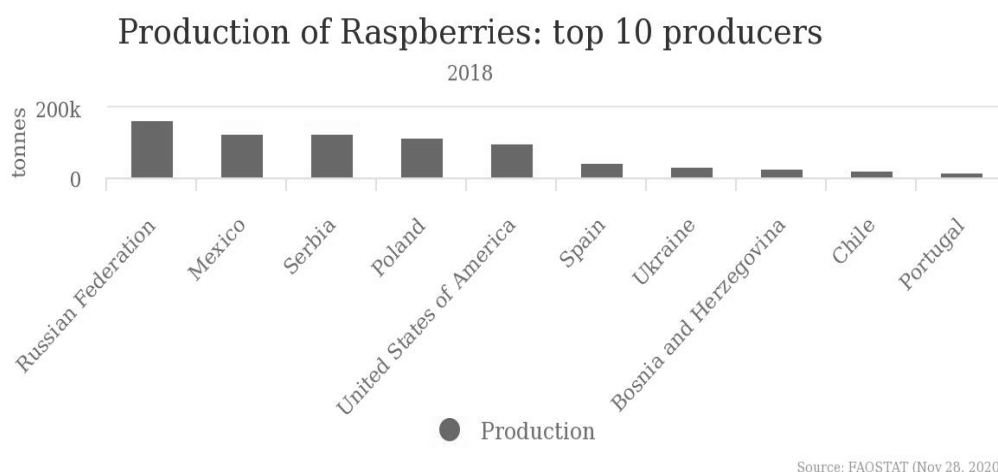
Production share of Raspberries by region



**Figure 1:** Production share of raspberries by region (2010-2018)<sup>1</sup>

<sup>1</sup> Source: Author's research according to data from [www.fao.org http://www.fao.org/faostat/en/#data/QC/visualize](http://www.fao.org/faostat/en/#data/QC/visualize)  
[International Journal of Research -GRANTHAALAYAH](http://www.fao.org/faostat/en/#data/QC/visualize)

The data obtained from FAOSTAT - Food and Agriculture Organization of the United Nations, show that the largest production of raspberries is recorded in Europe (70.3%), followed by the United States (27.4%). Raspberry production in Asia (2.1%), Africa (0.1%) and Oceania (0.1%) are negligible for the period 2010-2018 (Figure 1).



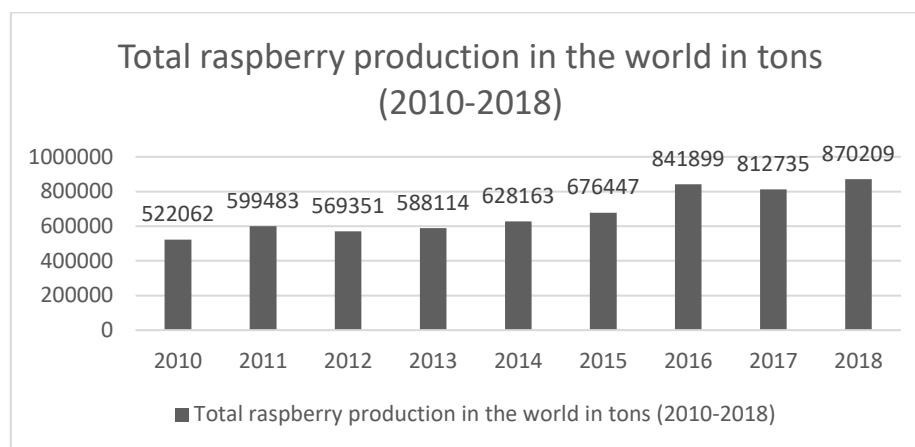
**Figure 2:** Production of Raspberries: top 10 World producers, tons, 2018<sup>2</sup>

The data in Figure 2 show that Russian Federation with a production of 165 800 tons of raspberries in 2018 occupies 19% of world production and is in first place in the world in terms of raspberry production, Mexico is in second place in terms of production of raspberries from 130 187 tons, and Serbia is on the third place with the total production of raspberries of 127 010 tons for 2018, and it is the third largest raspberry producer in the World.

Nearly one quarter of the world's total raspberry production is generated in Serbia, with almost all of the production being exported (Šapić S. et. all., 2020, pp. 226)

Republic of North Macedonia, on the other hand, with the production of raspberries of 224 tons in 2018 is on the 33rd place and occupies 0.03% of the total world production of raspberries from a total of 45 countries. This is probably due to insufficient support by state institutions responsible for supporting raspberry production. Republic of North Macedonia has the necessary conditions for the production of raspberries, but still this branch is not fully developed in the country. Greater support is needed to motivate raspberry growers, and ensure their product is marketed securely.

The world production of raspberries from 2010 to 2018 is increasing every year, with the demand itself growing and therefore there is a need for increasing production. Although in this period the world production has grown by about 300 000 tons, every year there is a growing demand for the offered available quantity on the market.



**Figure 3:** Raspberry production in the World, quantity in tons (2018)<sup>3</sup>

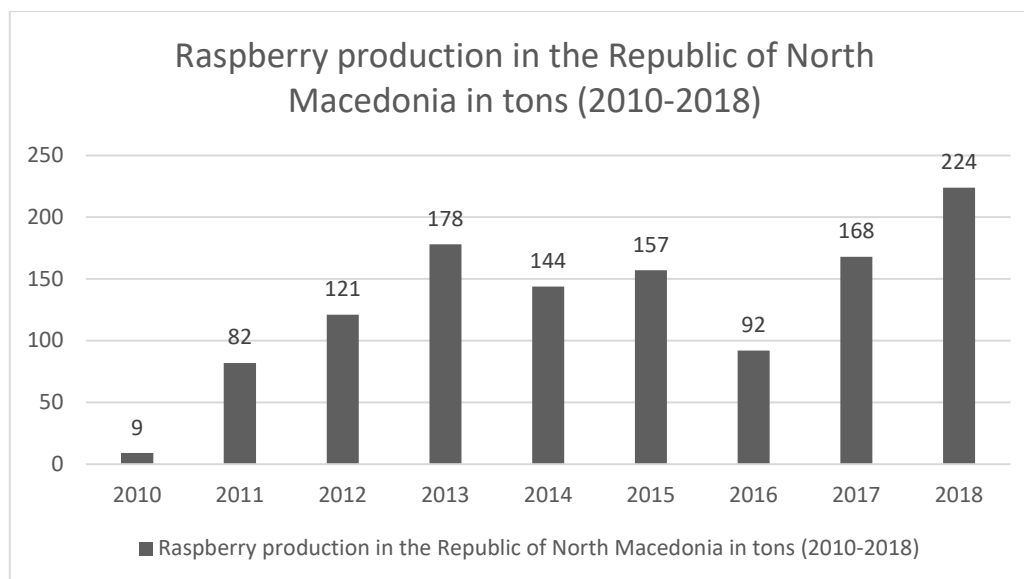
<sup>2</sup> Source: Author's research according to data from [www.fao.org](http://www.fao.org) <http://www.fao.org/faostat/en/#data/QC/visualize>

<sup>3</sup> Source: Author's research according to data from [www.fao.org](http://www.fao.org) <http://www.fao.org/faostat/en/#data/QC/visualize>  
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## Analysis of Market Opportunities for Raspberry Production in The Republic of North Macedonia

In this period, the largest world raspberry production is evidenced in 2018 with 870209 tons while the lowest production is in 2010 with a total world production of 522 062 tons (Figure 3).

In 2017, the area of land planted with raspberries is a total of 118 219 hectares. According to the area of raspberries planted in 2017, in first place is Poland with 29,317 hectares of land planted with raspberries, followed by Serbia with 21 861 hectares and in third place is Russia with 20 185 hectares of land planted with raspberries, due to primarily due to the ideal climatic and soil conditions in these countries that enable good raspberry production as well as the export policies that these countries have which makes production favorable for producers. As much as 25% of the total area on which raspberries are produced in the world belongs to Poland to 18% belongs to Serbia and 17% to Russia while Macedonia participates with 0.024% in the total area planted with raspberries in the world<sup>4</sup>.



**Figure 4:** Raspberry production in the Republic of North Macedonia in tons (2010-2018)<sup>5</sup>

Despite the relatively small production of raspberries in the Republic of North Macedonia, in 2018 there was a significant increase in raspberry production (by 96%) compared to 2010. In the analyzed period, there is an increase in the amount of raspberry production from year to year. In 2018, the production of raspberries increased by 215 tons compared to 2010 when only 9 tons of raspberries were produced (Figure 4).

In terms of yield, it is noticeable that in Republic of North Macedonia, the yield of raspberries over the years has quite a significant fluctuation with the highest yields in 2010 with 90,000 hg / hectare so that every next year this number experiences a significant decrease until 2016 when it has the lowest value, i.e., it reaches 43 810 hg/hectare, which is 51% less compared to 2010. In 2017, the yield of raspberries increased again by 27% compared to 2016<sup>6</sup>.

The growth, profitability and competitiveness of the sector must be improved through investments in all phases (production, processing and distribution) and changes in the export structure. Product packaging, design and transportation should be improved especially for the export markets (Milić D. et. all., pp.167) This increase in the yield of raspberries in Republic of North Macedonia in 2017 compared to the previous year is presumed to be due to the improvement of the conditions for production of raspberries in Republic of North Macedonia, i.e. increased support for raspberry growers as well as with increase in the number of subcontractors that work together as agricultural cooperatives for the production of raspberries, which for one hectare (10.000 square meters) of raspberry plantations, have an initial investment of only one euro, as a result of numerous projects to support agricultural production but also due reducing the price of seedlings. This reduced the producers' initial investment, which made this an attractive business for them. In practice, this is an investment of about 10.000 euros per hectare, which is actually twice as small because a state subsidy can be used to build new orchards, which is 50%

<sup>4</sup> <https://www.tilasto.com/en/topic/geography-and-agriculture/crop/raspberries/raspberries-area-harvested>

<sup>5</sup> Source: Author's research according to data from [www.fao.org](http://www.fao.org) <http://www.fao.org/faostat/en/#data/QC/visualize>

<sup>6</sup> <https://www.tilasto.com/en/country/macedonia/geography-and-agriculture/raspberries-yield>

of the investment. This means that the real investment costs 5.000 euros. From the first harvest, which is a year and a half after planting raspberries, if grown as prescribed, there will be a yield of about 20 tons. Those 20.000 kilograms, if sold at a price of one euro, as much as last year, is 20.000 euros. Of this amount, about 6.000 euros are for the collectors, and the remaining 14.000 euros are net earnings because the state subsidizes the maintenance of the plantations themselves. This is expected to follow this trend of increasing raspberry production in Republic of North Macedonia in the future. Macedonia especially with the increase and the sale and export of raspberries produced in Republic of North Macedonia that are in demand on the market due to their unique quality and bliss.

Intensive raspberry production requires organized approach to improving product quality, increasing the economic efficiency of primary production and processing as well as the active role of the state (providing loans for production of exported commodities under favorable conditions, protection of raspberry as a product of national interest, etc.) (Kljajić N., 2017, pp. 46).

#### **4. CONCLUSION**

Unfortunately in Republic of North Macedonia agriculture producers are still not interested in growing raspberries, because it is not in line with the Macedonian tradition. Although in this country there are favorable soil and climatic conditions for its cultivation, it is a deficient fruit crop. It is grown on an area of several hectares. Considering the requirements of this crop in terms of ecological conditions, appropriate regionalization has not been performed, i.e. raspberry plantations have been established in areas that are not very favorable for its development and fertility. Yield per unit area is quite low, despite the biological potential of the crop. With appropriate agro and technical measures provide a yield of over 20 tons/ha. There are other reasons for the low yield, such as: use of inappropriate assortment, lack of tradition for growing raspberries, inadequate agricultural techniques, insufficient supply of labor for growing and harvesting, low purchase prices, etc.

Given the high market demand on the one hand and the lack of fruit on the other hand, in the future its production should be intensified, which can be achieved by solving the above-mentioned disadvantages such as: introduction of high quality varieties and varieties for mechanized fruit harvesting, zoning or cultivation of raspberries in appropriate climatic and soil conditions, use of quality planting material, application of appropriate agro-techniques and new technologies in production. It is especially important that the appropriate trade organizations with fruit seedlings, etc., agree on prices with producers and that there are guaranteed purchase prices, which will ensure greater stability of raspberry production. Nothing will be achieved if there is no fair relationship and good cooperation and agreement between manufacturers.

Farmers who want to grow raspberries need to make the right choice of varieties and the right choice of region. The choice of variety is the most important factor for successful raspberry production. More than 1000 varieties have been created, but the number of economically significant varieties is small. In terms of assortment, among the leading varieties of raspberries are the homogeneous varieties "Vilamet" and "Miker". Planting material of all two varieties in Republic of North Macedonia produces only the Agricultural Institute in Skopje. If the farmer wants to import material from other wholesale varieties, they should be entered in the National Variety List.

As a conclusion from all this it can be said that in the future in Republic of North Macedonia is expected to increase the yield of raspberries as a result of improving the conditions for raspberry production, ie increasing the support of raspberry growers in the country. The increase in the number of subcontractors that function together as agricultural cooperatives for raspberry production also contributes to all this.

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#### **CONFLICT OF INTEREST**

The author have declared that no competing interests exist.

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