

## ANALYSIS OF THE WALNUT PRODUCTION AND MARKETING SECTOR IN ROMANIA

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### Abstract

*This paper analyzes the walnut production and marketing sector in Romania during 2016-2020. In order to capture the evolution of this sector better, it was necessary to analyze specific indicators such as: the number of walnuts existing in fruit-bearing plantations at national and macro-regional level; total walnut production achieved at national and macro-regional level; average nuts production per tree at national and macro-regional level; average prices for the category "Walnuts in shell"; average annual consumption per capita of nuts; quantitative imports and exports for the category "Walnuts in shell" related to Romania. Nowadays, Romania currently ranks first in walnut production in the European Union.*

*The increase in the interest for this culture was highlighted on the one hand, as the demand on the internal market increased, and on the other hand, as the fruit growers' accessed the European Union funds.*

*The statistical data that were used to carry out this study were taken from the National Institute of Statistics and from the FAO website.*

**Key words:** walnuts; nuts production; average annual consumption per capita of nuts; exports and imports for the category "Walnuts in shell"; Romania

### INTRODUCTION

Walnut (*Juglans regia* L.) is a tree that belongs to the family Juglandaceae, with about 40 species, and has as its area of spread, especially the temperate and Mediterranean areas, on the one hand, as spontaneous flora and, on the other hand, as crops. Walnut is native to Central Asia (<https://ro.wikipedia.org/wiki/Nuc>).

Walnut is especially important for its fruits. These are considered a concentrated food because they have a very complex chemical composition.

Nuts are very good for human health if they are eaten regularly. Specialist studies have shown that antioxidants in nuts help prevent many diseases that are so prevalent today ([https://unctad.org/system/files/official-document/Moldova-NGER-Report-Edited-05-07-2018\\_translated\\_Conft\\_checked\\_RO.pdf](https://unctad.org/system/files/official-document/Moldova-NGER-Report-Edited-05-07-2018_translated_Conft_checked_RO.pdf))

Romanians appreciate and consume fresh fruit, especially those who prefer healthy foods or those who follow certain diets. The list of favorite fruits includes pears, plums, peaches, apples, grapes and nuts. (Chiurciu, 2019; Soare et al., 2019, Soare and Chiurciu, 2018).

In Romania, walnut culture is found in all macro-regions. The activity of producing walnuts is favored, on the one hand, by the pedoclimatic conditions, and on the other hand, by the increase of the interest for this culture (<https://www.madr.ro/docs/agricultura/legume-fructe/Ghid-Pomicultura-final.pdf>).

Walnuts along with other categories of fruits are produced in Romania, in significant quantities and provide, on the one hand, a large proportion of the consumption needs of the population, and on the other hand, considerable income for fruit growers ([https://www.economica.net/romania-in-topul-producatorilor-de-nuci\\_158834.html](https://www.economica.net/romania-in-topul-producatorilor-de-nuci_158834.html)).

In the future, Romania may expand the area cultivated with walnuts to the level of all macro-regions, which would entail the increase of the nuts production realized internally. This fact would lead to placing Romania in the top of the first registered producers worldwide (Cuzino, 2021; Tănăsescu, 2005).

## **MATERIAL AND METHOD**

For the period 2016-2020, in this research were analyzed the most representative indicators for the sector of production and marketing of walnuts in Romania.

The analyzed indicators focused mainly on: the number of walnuts existing in fruit-bearing plantations at national and macro-regional level; walnut production at national and macro-regional level; the average production of nuts per tree obtained at national and macroregional level; average prices for the category "Walnuts in shell"; average consumption of nuts per capita; quantitative imports and exports for the category "Walnuts in shell" related to Romania.

The statistical data that were processed and analyzed in this research were taken from the National Institute of Statistics and the FAO website. In order to highlight as concisely as possible, the results of the research, it was necessary to present them both in tabular and graphic form.

## **RESULTS AND DISCUSSIONS**

It should be noted that the number of walnuts in fruit-bearing orchards is an important aspect for the walnut production sector in Romania.

During the period on which this analysis was focused, walnut orchards were owned by farmers of smaller sizes compared to other crop categories. Another important aspect to be mentioned is the growing interest in this crop with the provision of EU funds for fruit growing (Romania-Tree Nuts report, 9/26/2016).

Table no. 1 shows the evolution of the number of fruit-bearing walnuts existing in plantations at national and macro-regional level, in the period 2016-2020. From the presented data it can be seen that the number of walnuts changed from one year to another during the analyzed period. The highest number of nuts was registered in 2020 (2,067,880 trees), and the lowest was in 2017 (1,842,007 trees). In the year 2020, at national level there was an increase in the number of nuts by 12.03%, compared to 2016.

At the macroregional level, the highest number of walnuts was registered in Macroregion 2. The highest number of walnuts was 799,609 trees (2020). This macro-region held in 2020, 38.66% of the number of walnuts registered at national level.

Macroregion 1 ranks second in terms of the number of existing fruit-bearing walnuts. The most significant number of walnuts was recorded in 2019 (552,509 trees). In 2020, this macro-region accounted for 26.71% of the number of existing walnuts nationwide.

*Table 1*

Evolution of fruit-bearing walnuts existing in plantations at national and macro-regional level in the period 2016-2020 (number)

Specification	2016	2017	2018	2019	2020	2020/2016 (%)
<b>Romania</b>	1,845,824	1,842,007	1,918,156	1,936,247	2,067,880	112.03
<b>MACROREGION ONE</b>	545,052	539,487	546,559	552,475	552,509	101.36
<b>MACROREGION TWO</b>	575,677	596,665	638,273	666,555	799,609	138.89
<b>MACROREGION THREE</b>	261,658	245,343	247,092	254,061	251,715	96.20
<b>MACROREGION FOUR</b>	463,437	460,512	486,232	463,156	464,047	100.13

Source: Source: NIS, 2021; own calculations

Macroregion Four is on the next position in terms of the number of fruit-bearing walnuts. In 2020, there was an insignificant increase in the number of fruit-bearing walnuts, of only 0.13%, compared to 2016. This macro-region,

in 2020, accounted for 22.44% of the number of existing fruit-bearing walnuts at national level.

Macroregion 3 recorded in the analyzed period the lowest number of fruit-bearing walnuts existing at macroregional level. In 2020, there was a decrease in the number of fruit-bearing walnuts by 3.80%, compared to 2016. This macroregion accounted for 12.17% of the number of existing fruit-bearing walnuts at national level.

In the future, we expect an increase in the areas occupied by walnut plantations, because we are witnessing an increase in the demand for walnuts both on the domestic market and on the international market, as consumers become more and more aware of the importance of a varied and healthy alimentation (Romania-Tree Nuts report, 9/26/2016).

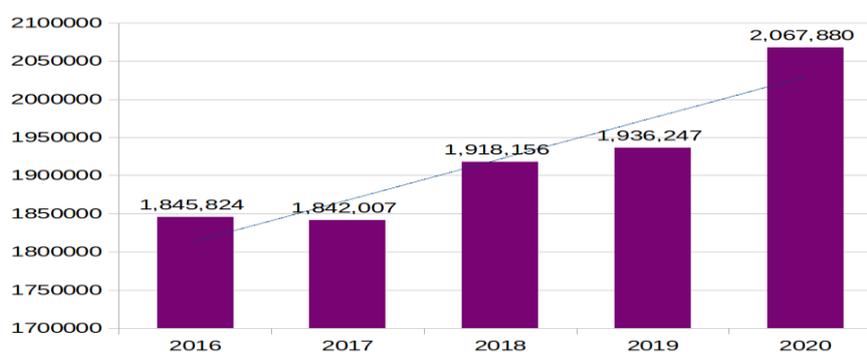


Fig.1. Dynamics of fruit-bearing walnuts existing at national and macro-regional level, in the period 2016-2020 (number)

Source: Own graph based on data provided by NIS

During the period under analysis, Romania passed from ranking second in the top of walnut producers in the European Union, on the first place, outrunning countries with tradition such as France and Spain. Another significant aspect that is worth mentioning is the fact that Romania is in the top ten nuts producers, registered worldwide. In table no. 1 it is shown the evolution of walnut production at national and macro-regional level.

From the data presented in the mentioned table it can be seen that, in the period 2016-2018, there was an increase in walnut production at national level, and in the period 2019-2020, walnut production decreased, compared to 2018. The highest nut production achieved at national level was 56,053 tons (2018), and the lowest was of 34,095 tons (2015). In 2020, the nut production achieved at national level increased by 47.42%, compared to 2016. This increase in walnut production by about 50% was mainly due to the expansion of fruit-bearing walnuts areas.

Table 2

Evolution of walnut production at national and macro-regional level in the period 2016-2020 (tons)

Specification	2016	2017	2018	2019	2020	2020/2016 (%)
<b>Romania</b>	34,095	45,797	56,053	51,602	50,266	147.42
<b>MACROREGION ONE</b>	9,836	13,195	16,636	15,103	14,477	147.18
<b>MACROREGION TWO</b>	10,673	14,602	17,569	16,310	16,052	150.39
<b>MACROREGION THREE</b>	4,988	6,468	7,798	7,315	7,545	151.26
<b>MACROREGION FOUR</b>	8,598	11,532	14,050	12,874	12,192	141.80

Source: NIS, 2021; own calculations

At the macroregional level, the production of nuts varied from one year to another during the analyzed period. From the data presented in the previous table at macroregional level, it was observed that Macroregion 2 (North-East and South-East Development Regions) achieved the most significant nut production in the analyzed period. The highest production was recorded in 2018 (17,569 tons). The second macroregion in 2018 achieved 31.34% of the walnut production registered at national level. In 2020, walnut production increased by 50.39% compared to 2016. This increase in walnut production in Macroregion 2 slightly exceeded the national increase for the same period analyzed.

Macroregion 1 (North-West and Central Development Regions) (NUTS 2 regions in Romania, 2010 and 2013) is on the second position in the top of walnut production carried out at the macroregional level. The highest nut production in this macroregion was of 16,636 tons (2018). This macroregion achieved 29.67% of the walnut production obtained at national level, in 2018.

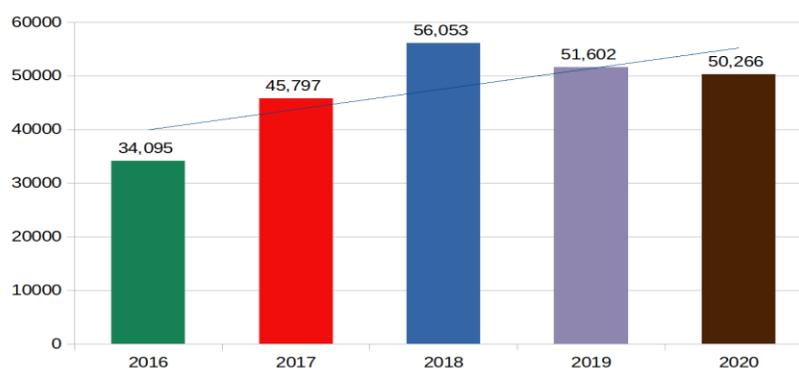


Fig. 2. Total walnut production achieved at national and macroregional level, in the period 2016-2020 (tons)

Source: Own graphic based on data provided by NIS

Macroregion Four (South-West Oltenia and West Development Regions) obtained productions between 8,598 tons - 14,050 tons in the analyzed period. In 2018, Macroregion Four achieved 25.06% of the walnut production obtained at national level. In 2020, here, the production of nuts increased by 41.80%, compared to 2016. The growth registered was below the national growth rate.

Macroregion three (Development regions Bucharest-Ilfov and South - Muntenia ) is ranked on the last place at the macroregional level in terms of nut production. The largest production of nuts was achieved in 2018 (7,798 tons). Here, in 2018, 13.91% of the total production was obtained at national level. In 2020, there was an increase in production by 51.26%, compared to 2016. From the data presented in the table above, it is easy to see that 2018 was a year in which record productions were obtained both nationally and at macroregional level.

The evolution of the average production of nuts per tree at national and macro-regional level, in the period 2016-2020, is presented in table no. 3.

From the data regarding the average nut production achieved per tree at national level, it can be seen that it fluctuated during the analyzed period. The most significant average production of nuts per tree at national level was recorded in 2018 (29 kg / tree). In 2020, the average production per tree increased by 33.33%, compared to 2016. The average production of walnuts per tree, realized in 2018, determined at a national level the achievement of a record production.

*Table 3*

Evolution of average walnut production per tree at national and macroregional level, in the period 2016-2020 (kg / tree)

<b>Specification</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2020/2016 (%)</b>
<b>Romania</b>	18	25	29	27	24	133.33
<b>MACROREGION ONE</b>	18	24	30	27	26	144.44
<b>MACROREGION TWO</b>	19	24	28	24	20	105.26
<b>MACROREGION THREE</b>	19	26	32	29	30	157.89
<b>MACROREGION FOUR</b>	19	25	29	28	26	136.84

Source: NIS, 2021; own calculations

Macroregion 3 recorded the highest average walnut production per tree in 2018 (32 kg / tree). This production exceeded the average production registered at national level for 2018. From the presented data it is found that in 2020 the average production increased by 57.89% compared to 2016.

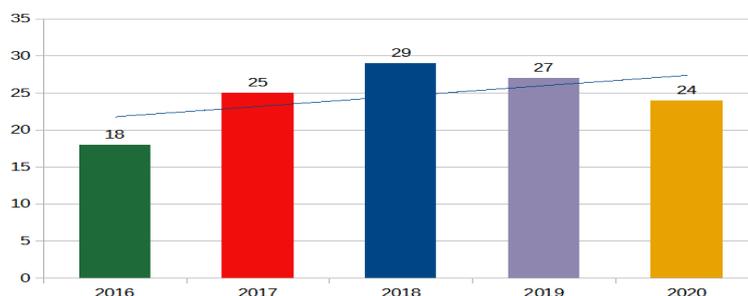


Fig. 3. Average production of nuts per tree achieved at national and macro-regional level, in the period 2016-2020 (kg / tree)  
Source: Own graphic based on data provided by NIS

In the rest of the macroregions, in 2020, the following increases of the average production of walnuts per tree were observed, compared to 2016, as follows: Macroregion 1 (+ 44.44%); Macroregion 4 (+ 36.84%) and Macroregion 2 (+ 5.26%).

The evolution of the average price for the category "Walnuts in shell" is presented in figure no.4. In the period 2016-2020, the average price registered a series of changes. The highest average price was recorded in 2018 (8.95 lei / kg), and the lowest average price was 7.02 lei / kg (2016).

In 2020, the average price for the category "Walnuts in shell" increased by 13.67% compared to 2016.



Fig. 4. The average price for the category "Walnuts in shell" at national level, in the period 2016-2020 (lei / kg)  
Source: Own graphic based on data provided by INS

It is worth mentioning that there is a substantial difference between the average price for the category "Walnuts in shell" and the category "Walnut kernel", the latter having a higher average price. The price is influenced by a series of factors, the most representative of which are: the supply of nuts; the demand for nuts; consumer preferences, traditions, etc.

The average annual consumption of nuts per capita in the period 2016-2019, varied from one year to another (see Fig. 5) The highest average annual consumption of nuts per capita was achieved in 2016 (4.1 kg), and the smallest was of 2.1 kg (2017). In 2019, the average annual consumption of nuts per capita increased by 34.15% compared to 2016. This decrease in consumption can also be attributed to the increase in the price for the category "Walnuts in shell" by 9.40% in 2019, compared to 2016.

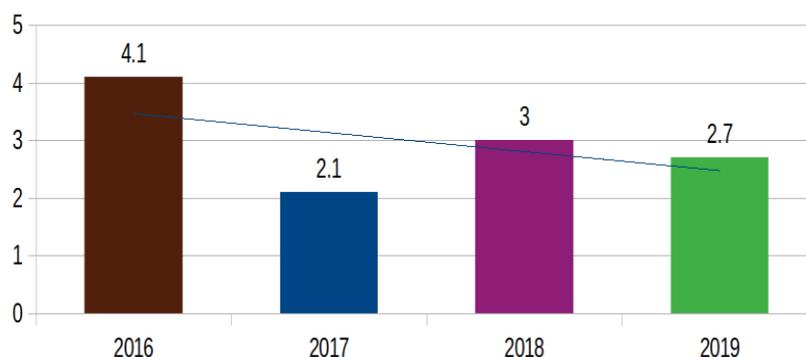


Fig. 5. Average annual consumption of nuts per inhabitant in Romania, in the period 2016-2019 (kg)

Source: Own graphic based on data provided by NIS

In the future, the average annual consumption of nuts per capita is expected to increase, as people tend to be more and more concerned about healthy diets. According to experts in the field, walnuts contain a number of minerals and vitamins that directly contribute to maintaining human health.

In table no. 4 are represented the quantitative imports and exports for the category "Walnuts in shell" related to Romania, in the period 2016-2019. From the data presented in the table it can be easily seen that imports are clearly superior to exports.

The most significant imports were made in 2017 (4,383 tons), and the lowest were 1,423 tons (2016). In 2019, the quantitative imports increased by 58.88%, compared to 2016.

Regarding the quantitative exports for the category "Walnuts in shell", it was found that they have decreased massively since 2017.

The largest quantitative exports were recorded in 2016 (946 tons). On the other hand, the lowest quantitative exports were recorded in 2018 (180 tons).

Table 4

Quantitative imports and exports for the category "Nuts in shell" related to Romania, in the period 2016-2019 (tons)

Specification	2016	2017	2018	2019
<b>Import</b>	1.423	4.383	2.899	2.261
<b>Export</b>	946	347	180	192

Source: FAOSTAT, 2021

Romania's quantitative exports for the "Walnuts in shell" category are low compared to domestic production. This fact demonstrates, on the one hand, that Romanian producers are mainly oriented towards the domestic market, and on the other hand, the domestic market has the capacity to absorb domestic production.

In 2019, the top 5 exporters for the category "Walnuts in shell" registered worldwide consisted of: United States of America (157,554 tons); China (74.193 tons); Chile (73.792 tons); United Arab Emirates (49,487 tons); Mexico (47,800 tons) (FAOSTAT, 2021).

## CONCLUSIONS

Following the analysis of the main indicators specific to the production and marketing sector in Romania, the following were found:

- In 2020, at national level, the highest number of existing nuts was recorded in fruit-bearing plantations, of 2,067,880 trees;
- Macroregion 2 registered the highest number of nuts in 2020 (799,609 trees);
- In 2018, the highest nut production was registered at national level, of 56,053 tons;
- The highest production achieved at the macroregional level was recorded at the level of Macroregion 2 in 2018 (17,569 tons);
- In 2018, the most substantial average production of nuts per tree at national level was achieved, of 29.0 kg;
- Macroregion 3, in 2018, recorded the highest average production of nuts per tree, of 32.0 kg, exceeding the average production achieved at national level;
- In 2018, the highest average price was registered for the category "Walnuts in shell", of 8.95 lei / kg;

- In 2016, the most substantial average annual consumption of nuts per inhabitant was highlighted, of 4.1 kg;
- In 2017, the largest quantitative imports were made for the category "Walnuts in shell" of 4,383 tons;
- In 2016, the largest quantitative imports were made for the category "Walnuts in shell", of 946 tons.

In the future, Romanian fruit growers have a high chance of producing significant quantities of nuts that will be directed more towards exports, because the demand on the international market tends to increase.

## REFERENCES

1. Chiurciu, I. A., 2019, Study on the production and marketing of apples in Bihor County, *Analele Universității din Oradea, Fascicula: Ecotoxicologie, Zootehnie și Tehnologii de Industrie Alimentară*, Vol.18, No.A, pp.11-15.
2. Cuzino, O., 2021, Why it's good to eat nuts (De ce e bine sa manănci nuci, 2021), <https://doc.ro/dieta-si-sport/beneficii-nutrienti-nuci>, accessed on 25.09.2021
3. Soare, E., Chiurciu, I. A., Bălan, A. V., David, L., 2019, Market analysis of pears in Romania. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 19 (1) p. 551-556.
4. Soare, E., Chiurciu, I. A., 2018, Trends in the production and marketing of apples in Romania. *Scientific Papers Series Management, Economic Engineering in Agriculture and rural development*, Vol. 18 (1), p. 465-472.
5. Tănăsescu, N., 2005, Fruit growing for all, University of Pitești Publishing House, p.211-215 (Pomicultura pentru toți, 2005, Editura Universității din Pitești, p. 211-215). <https://www.slideshare.net/nicolae1/pomicultura-pentru-toti>, accessed on 20.09.2021
6. FAOSTAT, 2021, <https://www.fao.org/faostat/en/#data>, accessed on 27.09.2021.
7. \*\*\*NIS, National Institute of Statistics, Tempo On-line Database, 2021, [www.insse.ro](http://www.insse.ro), accessed on 04.09, 2021.
8. \*\*\*NUTS 2 regions in Romania, 2010 and 2013, <https://ec.europa.eu/eurostat/documents/345175/7451602/nuts-map-RO.pdf>
9. \*\*\*Romania-Tree Nuts report, 9/26/2016, accessed on 28.09.2021. [https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Romania%20-%20Tree%20nuts%20report\\_Bucharest\\_Romania\\_10-5-2016.pdf](https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Romania%20-%20Tree%20nuts%20report_Bucharest_Romania_10-5-2016.pdf), accessed on 29.09.2021.
10. \*\*\*[https://www.economica.net/romania-in-topul-producatorilor-de-nuci\\_158834.html](https://www.economica.net/romania-in-topul-producatorilor-de-nuci_158834.html), accessed on 10.09.2021.
11. \*\*\*<https://www.madr.ro/docs/agricultura/legume-fructe/Ghid-Pomicultura-final.pdf>, accessed on 12.09.2021.
12. \*\*\*<https://ro.wikipedia.org/wiki/Nuc>, accessed on 18.09.2021.
13. \*\*\*[https://unctad.org/system/files/official-document/Moldova-NGER-Report-Edited-05-07-2018\\_translated\\_Conft\\_checked\\_RO.pdf](https://unctad.org/system/files/official-document/Moldova-NGER-Report-Edited-05-07-2018_translated_Conft_checked_RO.pdf), accessed on 15.09.2021.