

## THE EVOLUTION OF THE FRUIT-GROWING SECTOR IN BIHOR COUNTY

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### Abstract

*This paper analyses the main indicators reflecting the evolution of the fruit-growing sector in the Bihor County for the period 2014-2018. The most important indicators which are analyzed are the areas occupied by fruit orchards, the number of fruit trees, the production of fruits, the average level of production for each of them, the average level of price for each of them. It can be observed that the total areas occupied with -fruit plantations on bearing and the total fruit production are decreasing. From an economic point of view, plum plantations have a particular importance, occupying the first place in the County, as number of fruit trees and as production obtained. The data used in the paper was taken from the National Institute of Statistics and specialized international sites. The results of this analysis have been highlighted in relevant tables and graphics.*

**Key words:** Bihor County, fruit production, fruit-trees sector

### INTRODUCTION

Bihor County is located in the western part of Romania, in the historical region, Crisana, on the border with Hungary. The varied relief consists of mountains, hills and plains and is crossed by the rivers Ier, Barcau, Crișul Repede, Crișul Negru and its tributaries. The total area of this county is 7,544 km<sup>2</sup> (*Bihor County*).

According to Annex I of the EC Regulation No. 1059/2003, Bihor County is one of the six counties - NUTS 3 - which compose the North-West Development Region, North Transylvania (*Aurelia Ioana Chereji, 2016*).

Bihor County ranks second in terms of GDP in the North West Region and tenth in the top of counties in terms of contribution to national GDP (*Invest in Bihor*)

After Chiurciu et al., 2018, citing Condei R. et al., 2015, and North-West Region Presentation, in the North-West Development Region, of which the analyzed county is part of, agriculture is on the third place in the

top of the economic sectors that participate to the regional GDP. Also, the labor employments in agriculture rank third the North-West Region.

The most developed branch of the agricultural sector in the county is the cultivation of cereals, Bihor County having the largest arable area, (*Manole Al.et al., 2014*).

The fruit-trees sector represents only 1.30% of the area occupied by the main crops in Bihor County, although the North-West Development Region has remarkable results in the number of cultivated apple trees, being first in the country (*NIS*).

In this context, the paper will present in the following the total area occupied with orchards on bearing, the fruit production, as well as the yields obtained and the average selling price of fruits in the agri-food markets in Bihor County.

## **MATERIALS AND METHODS**

In order to present the evolution of the fruit-trees sector in Bihor county, the following indicators were analyzed: orchards on bearing- total areas, areas of the private sector, areas of individual agricultural holdings, total number of fruit trees and number for each fruit species, total production obtained and fruit production by fruit species, average production for the fruit species analyzed and the average selling price of the fruit in the agri-food markets. The indicators in this study were analyzed for the period 2014-2018.

All the results in this paper were presented in tables, illustrated graphically and interpreted.

## **RESULTS AND DISCUSSION**

In Romania, an important sector of activity is represented by the fruit production and marketing sector because, firstly, it provides the fruit quantities needed by the population for consumption and, secondly, it represents a part of the agri-food products export. Since joining the European Union, this sector became sustained by structural funds and measures to help developing the rural space (*Dona I., 2015*).

From the data taken from NIS, it can be seen that, in 2018, from the total of 261.5 thousand people engaged in activities that contribute to the national economy in the Bihor County, 23.98% worked in agriculture, forestry and fishing.

Thereby, Figure 1 shows the total areas cultivated with orchards on fruit, in the period 2014-2018.

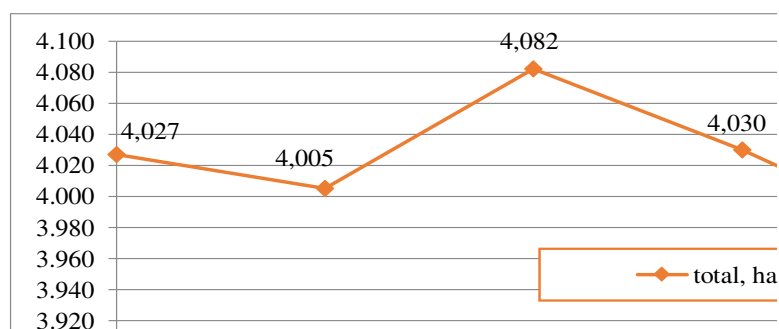


Fig. 1. Dynamics of the orchards on fruit, total area (ha) in Bihor County, 2014-2018

Source: NIS, Tempo On-line Database, 2019

In 2016 the largest area occupied by orchards was registered, of 4,082 ha, and the smallest in 2018, of 3,969 ha, in the total category. It is noticeable that from 2016 the orchards on fruit are declining. Compared to 2014, the decrease in 2018 was of 1.44%.

Table 1 analyzes the surfaces of the private sector with orchards on fruit and highlights those of the individual agricultural holdings in the period 2014-2018.

In the private sector, the same trend of decreasing the cultivated areas with orchards on fruit (-1.44%) is noted. For orchards in individual farms, the decrease was of 0.86%, in 2018 compared to 2014.

*Table 1*  
Surface occupied with orchards on fruit in the private sector, in the Bihor County during the period 2014-2018 (ha)

Nr. crt.	Specification	2014	2015	2016	2017	2018	2018/2014 %
1.	Private sector,	4,027	3,995	4,072	4,030	3,969	98.56
	from which: individual farms	3,960	3,892	3,924	3,912	3,926	99.14

Source: Own calculation based on NIS, Tempo On-line Database, 2019

Of the total orchards on fruit, those from the individual agricultural holdings held 98.92%, in 2018, increasing compared to 2014, when they represented 98.37%.

The orchards on fruit of the individual agricultural holdings, which have the largest share of the total area of orchards in Bihor county, represented in 2018 17.51% of the total area of orchards in the North-West Development Region.

Figure 2 shows the total number of fruit trees in Bihor County, for the period 2014-2018. For the analyzed period there is a slight decrease of this number. In 2018, 0.79% less trees were cultivated compared to 2014. The highest number was registered in 2016, of 2,036,239, and the lowest in 2018, of 2,015,494.

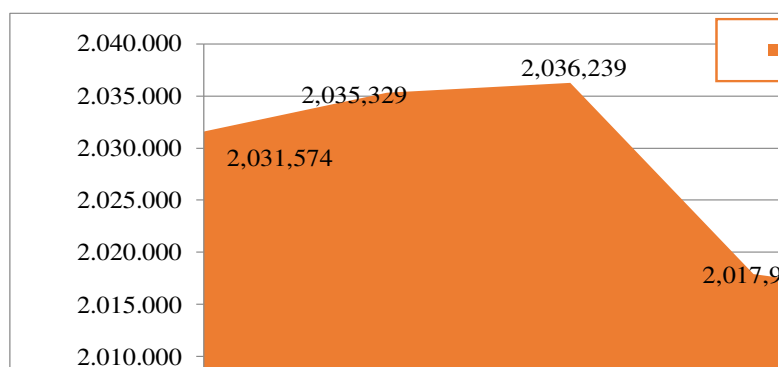


Fig. 2. The dynamics of the total number of fruit trees in the period 2014-2018  
Source: NIS, Tempo On-line Database, 2019

Table 2 contains data on the number of trees from the main fruit trees species grown in the county, for the period 2014-2018.

The largest decrease in the number of trees is recorded in the category nectarines, of 27.40%, and the highest increase in the category "other fruit trees" - 84.02%. Decreases in the number of trees grown are also noted for plums, peaches and nuts.

Analyzing the centralized data in table 2 we notice that plum is the most cultivated fruit species in Bihor County. In 2014, a number of 730,191 plums were cultivated, so that this number would decrease, in 2018 being registered 721,204 plums, with 1.23% less.

According to Dana D. et al., 2018, plums are not the most numerous fruit trees in Macroregion One, which ranks 3rd in this category. In contrast, they are the most cultivated in the North-West Development Region, which owns 74.76% of the total plums grown in Macroregion One (NIS).

Table 2

Number of fruit trees, by fruit species, in the Bihor County during 2014-2018

Nr. crt.	Category of fruit trees	2014	2015	2016	2017	2018	2018/2014 %
1.	Plums	730,191	727,009	724,080	722,322	721,204	98.77
2.	Apples	616,169	644,498	630,834	632,819	620,150	100.65
3.	Pears	125,141	125,486	125,906	125,606	125,780	100.51
4.	Peaches	224,759	209,947	222,579	205,009	205,030	91.22
5.	Nectarines	13,031	8,868	9,492	9,463	9,460	72.60
6.	Cherries	131,494	130,368	132,179	131,746	132,487	100.76

	and sour cherries						
7.	Apricots	113,146	113,542	115,737	114,874	114,855	101.51
8.	Walnuts	65,347	63,439	63,460	64,636	63,901	97.79
9.	Other fruit trees	12,296	12,172	11,972	11,428	22,627	184.02

Source: Own calculation based on NIS, Tempo On-line Database, 2019

The following fruit species commonly found in the county are apples and peaches. The number of apples increased during the analyzed period by 0.65%, while the number of peaches decreased by 8.78%.

Although in the North-West Development Region are cultivated the most apples in the country (*Soare E., Chiurciu I.A., 2018*), in Bihor county this species is ranked 2nd.

Other fruit species grown in the county, which registered in 2018 over 100,000 copies were: cherries and sour cherries - 132,487, pears - 125,780, apricots - 114,855. At all these fruit species there were seen slight increases in 2018, compared to 2014.

Regarding the fruit production, figure 3 shows the total quantity harvested in Bihor county during 2014-2018. In 2018 the total fruit production decreased by 5.04%, compared to 2014.

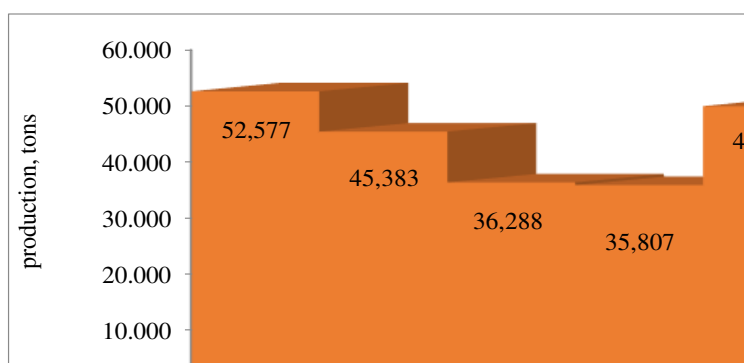


Fig. 3. Dynamics of total fruit production during 2014-2018

Source: NIS, Tempo On-line Database, 2019

The highest amount of fruits was obtained in 2014 - 52,577 tons. This production (t) does not correspond to the largest area (ha), but is influenced by the total production obtained for each species and by the average production / tree. The lowest production was recorded in 2017 - 35,807 tons.

As expected, the largest fruit production was obtained from plums (Table 3). In 2018 there was an increase of 38.38%, compared to 2014. The year in which the smallest quantity was harvested was 2016 - 9,314 tonnes.

Table 3

Fruit production (tonnes) in Bihor County during 2014-2018							
Nr. crt.	Category of fruits	2014	2015	2016	2017	2018	2018/2014 %
1.	Plums	14,087	15,622	9,314	11,263	19,493	138.38
2.	Apples	20,768	15,071	12,124	12,370	15,721	75.70
3.	Pears	2,373	2,095	2,212	1,912	1,772	74.67
4.	Peaches	7,992	7,569	7,349	4,749	6,537	81.79
5.	Nectarines	412	197	229	117	126	30.58
6.	Cherries and sour cherries	1,843	1,703	1,726	1,230	1,869	101.41
7.	Apricots	3,523	1,573	1,634	1,877	1,905	54.07
8.	Nuts	945	850	999	1,565	1,747	184.87
9.	Other fruits	427	493	421	339	405	94.85

Source: Own calculation based on NIS, Tempo On-line Database, 2019

Other categories of fruit that saw increases in production are cherries and sour cherries - 1.41% and nuts.

The decrease in the production of cherries and sour cherries at the level of the Macroregion, in the first part of the analyzed period, followed by the increase of the production, was also manifested at the county level, as shown in the table above (Soare E., Dobre I. 2018).

The production obtained from nuts had the highest increases, of 84.87%. This fact is due to the non-reimbursable European funds, accessed through the sub-measures PNDR 2014-2014 (AFIR). Walnut was one of the favorite fruit-tree species when setting up new orchards.

For the other categories of fruits there were decreases in production, and the largest decrease was at nectarines - 69.42%.

Although they are appreciated by consumers, the production of pears in the year 2017, in Romania, occupied only 4.61% of the fruit production realized (Soare E., et al., 2019), and due to the small production obtained in Bihor county (1,912 tonnes in 2017, 1,772 tonnes in 2018).

Average production (kg / tree) recorded fluctuations during the analyzed period (Table 4). There have been increases in plums and nuts and decreases for all the other fruits found in the Bihor County culture.

The largest increases in average production were recorded at nuts - 92.86%, and the largest decreases at nectarines (59.37%).

Table 4

Average fruit production (kg / tree) in Bihor County during 2014-2018							
Nr. crt.	Category of fruits	2014	2015	2016	2017	2018	2018/2014 %
1.	Plums	19	21	13	16	27	142.11
2.	Apples	34	23	19	20	25	73.53
3.	Pears	19	17	18	15	14	73.68
4.	Peaches	36	36	33	23	32	88.89

5.	Nectarines	32	22	24	12	13	40.63
6.	Cherries and sour cherries	14	13	13	9	14	100
7.	Apricots	31	14	14	16	17	54.84
8.	Nuts	14	13	16	24	27	192.86
9.	Other fruits	35	41	35	29	18	51.43

Source: Own calculation based on NIS, Tempo On-line Database, 2019

For cherries and sour cherries, although the average production recorded variations during the analyzed period (in 2017, 9 kg / tree represented the most average production for all the analyzed fruit-tree species), in 2018 14 kg / tree were also obtained, as in 2014.

As shown in Table 5, average prices of fruits sold in Bihor County increased in 2014-2018. Apricots had the highest growth (34.46%), followed by peaches, 29.49%, a fact also due to the decrease of the total production and of the average production.

*Table 5*  
Average annual prices of fruits sold in the agri-food markets, in the Bihor County during 2014-2018, (lei / kg)

Nr. crt.	Category of fruits	2014	2015	2016	2017	2018	2018/2014 %
1.	Plums	2.5	2.54	2.52	3.36	2.85	114
2.	Apples	2.75	2.75	2.79	2.97	3.21	116.73
3.	Pears	4.92	4.55	4.88	5.21	5.13	104.27
4.	Peaches	3.73	3.77	3.9	3.86	4.83	129.49
5.	Cherries	7.06	6.65	7.88	8.12	7.74	109.63
6.	Sour cherries	5.34	5.06	5.71	6.5	5.74	107.49
7.	Apricots	4.15	4.92	5	4.27	5.58	134.46
8.	Nuts	8.04	9.29	7.13	8.8	9.12	113.43

Source: Own calculation based on NIS, Tempo On-line Database, 2019

In 2018, the highest average selling price was for nuts, 9.12 lei / kg and cherries, 7.74 lei / kg. Plums recorded the lowest price of 2.85 lei / kg.

Today, worldwide, there is a particular emphasis on the consumption of fruits and vegetables. Specialists recommend that one should eat more than 400 grams of fruits and vegetables per day (*Pirvutoiu I., Popescu A., 2013*).

## CONCLUSIONS

Located in the historical region Crisana, Bihor County is one of the six counties that compose the North West Development Region.

Fruit growing is not the main branch of agriculture practiced in the County, although the development region of which it is part of, has the largest number of fruit trees in the country.

The orchards on fruit of the individual agricultural holdings held 98.92%, in 2018 out of the total area occupied by orchards. For the analyzed period there is a decrease of these surfaces.

The most cultivated fruit-tree species in Bihor County is plum, although we notice a decrease in the number of these trees, as well as in the total number of fruit trees.

The total fruit production decreased by 5.04%, in 2018 compared to 2014. However, in the following categories there were increases: plums, nuts, cherries and sour cherries.

Between 2014-2018, average prices of fruits sold in Bihor County increased. The apricots had the highest growth, followed by peaches and apples.

## REFERENCES

1. AFIR, <https://www.afir.info/>, accessed on 04.10.2019
2. Chereji A.I., 2016, Rural development. Ed. Primus, Oradea, 23-25
3. Chiurciu I.A., Chereji A.I., Soare E., Chereji I. Jr., 2018, Study on the evolution of agriculture in the North-West Development Region. Annals of the University of Oradea, Fascicle: Ecotoxicology, Animal Husbandry and Food Science and Technology, Vol. XVII/A, 9-16
4. Condei R., Popescu A., Bălan A., Tudor V. 2015, Aspects of employment in agriculture in the main development regions of Romania. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 15 Issue 2, Print ISSN 2284-7995, 67-74
5. Dana D., Chiurciu I.A., Voicu V., Soare E. 2018, The Management of the plots and of the plum orchards using an Expert System-Crom. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 18 Issue 1, Print ISSN 2284-7995, 137-142
6. Dona I., 2015, Rural economy, Ed. Economica, 74-75
7. Invest in Bihor, <https://investinbihor.com/economie/>, accessed on 03.10.2019
8. ICPA Bucuresti, Bihor County, [https://www.icpa.ro/proiecte/Proiecte%20nationale/sicomant/SICOMANT\\_Raport2\\_2.pdf](https://www.icpa.ro/proiecte/Proiecte%20nationale/sicomant/SICOMANT_Raport2_2.pdf), accessed on 04.10.2019
9. Manole Al., Diaconu A., Anghel M. G., 2014, General aspects concerning the development of the North-West Region of Romania. [http://www.revistade statistica.ro/supliment/wp-content/uploads/2014/11/RRSS19\\_2014\\_A11.pdf](http://www.revistade statistica.ro/supliment/wp-content/uploads/2014/11/RRSS19_2014_A11.pdf), accessed on 03.10.2019
10. NIS, National Institute of Statistics, Tempo On-line Database, 2019, [www.insse.ro](http://www.insse.ro), accessed on 04.10.2019
11. North-West Region Presentation, <http://www.adrnord-vest.ro/DESPRE-NOI%20Agentia-de-Dezvoltare-Regionala-Nord-Vest/REGIUNEA-TRANSILVANIA-DE%20NORD/Prezentare-Regiune.html>, accessed on 04.10.2019
12. Pirvutoiu I., Popescu A., Trends in Romania's fruit market, 2013. Annals of the University of Craiova - Agriculture, Montanology, Cadastre Series/Analele Universității din Craiova, seria Agricultură - Montanologie - Cadastru, Vol. XLIII 2013, 164-169, <http://anale.agro-craiova.ro/index.php/aamc/article/view/86/82>, accessed on 03.10.2019



13. 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 Issue 1, Print ISSN 2284-7995, pp 465-472
14. Soare E., Chiurciu I.A., Balan A.V., David L. 2019, Market analysis of pears in Romania. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 19 Issue 1, Print ISSN 2284-7995, 551-556
15. Soare E., Dobre I. 2018, Research on cherries sector in Romania. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 18 Issue 2, Print ISSN 2284-7995, 431-440