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RESEARCH ON THE EVOLUTION OF FRUIT FARMS IN ROMANIA, IN THE PERIOD 2005-2016

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Abstract

The trade balance in the fruit sector of Romania shows significant deficits, which are accentuated from one year to another. In order to identify the causes leading to these issues, the main source of the problem, namely fruit farms, was analyzed. The aim of the paper is to identify the causes, based on which, the best solution for this problem is the association of fruit growers. In this paper, the fruit farms were analyzed in the period 2005-2016 (being the most recent data available), depending on the legal form, physical size and economic size, using quantitative and qualitative methods of data processing.

Key words**:** *fruit growing, fruit sector, holdings, association*

INTRODUCTION

Agricultural activity, whether it is the cultivation of plants, the establishment and maintenance of fruit and vineyards, or the raising of animals, all have an important influence on the way rural areas are, as well as development prospects. The way agriculture is practiced in rural areas, the attention for the community are elements that can ensure continuity in this space that abounds in traditions and customs and where the identity of a country is best represented [3, 8, 9].

Fruit plantations hold an important place in the total crops cultivate in Romania, on the one hand because both the climate and the soil allow the cultivation of fruit trees on large areas, but also because, from north to south and from east to west, different species of fruit trees can be grown, which could cover the consumption needs of the population [7].

Consumption of fresh fruit has increased significantly in recent times, on the one hand due to the fact that there have been numerous information campaigns on the beneficial effects of eating fresh fruit, and on the other hand consumers around the world have become much more concerned to what they eat and to ensure the necessary intake of vitamins [11, 12].

The easy access of consumers to farm products is extremely important, especially in these times when everything happens very quickly, and consumers are looking for healthy food sources, obtained locally, but to which they have immediate access.

After 1990 and until now, the Romanian fruit sector has been marked by a continuous decline that has impacted, on the one hand, the extent to which rural areas have evolved, but has also had negative consequences on the way of life of communities in these predominantly fruit regions [1, 2].

Given the decline of fruit farms, for the 2014-2020 programming period, through PNDR, the fruit sector had dedicated financial support measures to solve the problems related to both production and storage and sales. The fruit sub-program within National Programeme of Rural Development (NPRD) 2014-2020 created the necessary premises to increase the competitiveness of fruit farms by investing in machinery and equipment, in new fruit plantations and fruit plantations for planting material, the development of research in this field, but also investments in marketing and processing.

Association in agriculture, regardless of the sector, is extremely important, even if the

sector is dominated by large farms or small and medium-sized farms.

The structural challenges related to the small and very small size of fruit farms, but also the influence of climate change and insufficient adaptation of supply to consumer requirements, indicate that association and cooperation in this sector are extremely important to balance the procurement process, necessary for the proper conduct of business on the farm [4].

The organization of small fruit farms in well-organized cooperative structures can help fruit growers to match and improve the production obtained on the farm, in accordance with consumer preferences. Associative forms also play an important role in the process of storage, conditioning and marketing of production [5].

MATERIALS AND METHODS

The data used to conduct the research are part of the Eurostat databases, accessed on 16.04.2021. For this purpose, quantitative and qualitative data processing methods were used, as well as the following coefficients [10]:

(i)The coefficient of variation (CV) is a statistical measure of the dispersion of data points in a series of data around the mean. The coefficient of variation is the ratio between standard deviation and average and is a useful statistic for comparing the degree of variation from one set of data to another, even if the means are drastically different from each other [10].

(ii)A standard deviation is a statistic that measures the dispersion of a data set relative to its average. The standard deviation is calculated as the square root of the variance by determining the deviation of each data point from the mean. If the data points are further than average, there is a larger deviation within the data set. Thus, the more widespread the data, the higher the standard deviation [10].

(iii)Growth is the value of an investment, an asset, a portfolio, a phenomenon or a business that grows over a period of time. The growth rate provides important information about the value of an asset or investment, contributes to understanding how the investment, the phenomenon studied increases, changes and behaves over time. This information is helpful to understand the trend and how the studied phenomenon will evolve [10].

RESULTS AND DISCUSSIONS

The highest rate in terms of the number of fruit farms without legal personality is recorded in the Western region, where in 2016 there were 4,630 farms without legal personality, 3 times more than in 2005 (Table 1).

For the analyzed period, the average of fruit farms without legal personality of 2,770 was determined, a positive rhythm of 32.1% and a coefficient of variation of 44.39%, which indicates a heterogeneous degree of the analyzed data (Table 1).

Table 1. Analysis of the number of fruit farms without legal personality, depending on the development region, in the period 2005-2016

Specifiction	2005	2007	2010	2013	2016	2016/ 2005	Average	Rythm (%)	C.V. (%)
Total	39,370	37,060	62,420	62,680	66,920	70.0	53,690.0	14.2	26.56
North West	7,850	9,460	14,250	13,030	16,510	110.3	12,220.0	20.4	28.90
Center	2,160	1,670	2,160	2,190	2,520	16.7	2,140.0	3.9	14.19
North East	1,500	2,410	3,800	3,050	3,570	138.0	2,866.0	24.2	32.52
South East	1340	1,600	3,270	2,800	2,500	86.6	2,302.0	16.9	35.31
South-Muntenia	17,630	15,250	26,810	28,840	27,970	58.7	23,300.0	12.2	27.29
Bucharest - Ilfov	1,310	360	320	360	260	-80.2	522.0	-33.3	84.75
South West Oltenia	6,060	4,450	9,140	9,230	8,970	48.0	7,570.0	10.3	28.94
West	1,520	1,850	2,670	3,180	4,630	204.6	2,770.0	32.1	44.39

Source: Eurostat data processing, Accessed on 16.04.2021 [6].

Another region where the number of fruit farms without legal personality registered an important evolution in 2016, compared to 2005 is the North-East region, where there were 3,570 fruit farms without legal personality, 2 times more than in 2005. For this region an average of 2,866 fruit farms without legal personality, a positive rate of 24.2% and a coefficient of variation of 32.52% was determined, which indicates a heterogeneous degree of the analyzed data (Table 1).

For the Center development region, the growth rate of the number of fruit farms without legal personality is less pronounced. Thus, if in 2005 there were 2,160 holdings without legal personality, in 2016 these holdings registered an evolution of only 16.7%.

Regarding the average of the analyzed period, for the Center development region resulted an average of 2,140, with a positive rate of 3.9% and a coefficient of variation of 14.19%, which indicates a relatively homogeneous degree of the analyzed data (Table 1).

The number of fruit farms registered significant oscillations during the analyzed period, depending on their physical size. At the level of 2016, in Romania, there were a total of 67,750 fruit farms, increasing by 70.4% compared to 2005, when there were a total of 39,770 fruit farms. During the analyzed period, an average value of fruit farms of 54,396 was determined, with a positive rate of 14.2% and a coefficient of variation of 26.75%, which indicates a relatively heterogeneous degree of the analyzed data (Table 2).

Table 2. Analysis of the number of fruit farms classified by physical size in the period 2005-2016

Specifiction	2005	2007	2010	2013	2016	2016/ 2005	Average	Rythm (%)	C.V. (%)
Total	39,770	37,420	63,500	63,540	67,750	70.4	54,396.0	14.2	26.75
0 ha	0	0	0	0	0	-	0.0	-	-
< 2 ha	29,720	22,860	49,220	48,650	52,370	76.2	40,564.0	15.2	32.86
2 - 4.9 ha	6,900	9,600	10,330	10,660	11,710	69.7	9,840.0	14.1	18.40
5 - 9.9 ha	2,080	2,850	2,720	3,060	2,800	34.6	2,702.0	7.7	13.68
10-19.9 ha	640	1,600	720	830	530	-17.2	864.0	-4.6	49.29
20-29.9 ha	150	160	140	100	120	-20.0	134.0	-5.4	17.97
30 - 49.9 ha	100	190	150	80	90	-10.0	122.0	-2.6	38.18
50 - 99.9 ha	80	80	80	70	60	-25.0	74.0	-6.9	12.09
> 100 ha	100	90	150	90	70	-30.0	100.0	-8.5	30.00

Source: Eurostat data processing, Accessed 16.04.2021 [6].

Regarding the physical size of fruit farms, the most numerous were farms with a physical size of less than 2 hectares. In 2016, 52,370 such fruit farms were registered, 76.2% more than in 2005 (29,720 fruit farms). For the analyzed interval was determined an average value of fruit farms less than 2 hectares of 40,564 fruit farms, a positive rate of 15.2% and a coefficient of variation of 32.86%, which indicates a heterogeneous degree of data analyzed (Table 2).

At the level of 2016, in Romania there were 11,710 fruit farms that had a physical size between 2 hectares and 4.9 hectares, 69.7% more than the values recorded in 2005 (6,900 fruit farms). During the analyzed period, an average value of fruit farms with a physical size between 2 hectares and 4.9 hectares of 9,840 was determined, with a positive rate of 14.1% and a coefficient of variation of 18.40%, which indicating a relatively homogeneous degree of the analyzed data (Table 2.).

The number of fruit farms with the largest decrease is those with a physical size of more than 100 hectares. If in 2010 there were 150 fruit farms with an area of more than 100 hectares, in 2016 their number decreased by almost half, reaching 70. For the analyzed interval was determined an average value of fruit farms larger than 100 hectares of 100 fruit farms, a negative rate of 8.5% and a coefficient of variation of 30%, which indicates a heterogeneous degree of the analyzed data (Table 2).

As fruit holdings with an economic size of less than 2,000 SO show by far the highest share of total fruit holdings, the table below presents and analyzes the situation of these holdings, being relevant for the study in question.

At the level of Romania, in 2016, there were no fruit farms that did not register any income from the activity carried out (economic size of 0 euros) (Table 3).

At national level, in 2016, there were 42,560 fruit farms with an economic size of less than 2,000 euros. Most farms are found in the South-Muntenia development region (18,870 fruit farms with an economic size of less than 2,000 euros). In 2016, compared to 2005, the number of fruit farms in the South-Muntenia region with an economic size of less than 2,000 euros, increased by 39.8%, registering an average of the analyzed period of 16,616 farms, with a positive rate of 8.7% and a coefficient of variation of 30.08%, which indicates a heterogeneous degree of the analyzed data (Table 3).

Table 3. Analysis of the number of fruit farms with an economic size of less than 2,000 euros, depending on the development region, in the period 2005-2016

Specifiction	2005	2007	2010	2013	2016	2016/ 2005	Average	Rythm (%)	C.V. (%)
Total	29,490	21,960	48,960	42,110	42,560	44.3	37,016.0	9.6	29.68
North West	5,460	5,550	11,280	8,580	9,330	70.9	8,040.0	14.3	31.29
Center	1,670	1,130	1,730	1,740	1,850	10.8	1,624.0	2.6	17.47
North East	1,160	1,320	3,120	2,140	2,440	110.3	2,036.0	20.4	39.82
South East	880	550	2,470	1,910	1,720	95.5	1,506.0	18.2	51.90
South-Muntenia	13,500	9,420	21,310	19,980	18,870	39.8	16,616.0	8.7	30.08
Bucharest - Ilfov	1,300	280	320	350	250	-80.8	500.0	-33.8	89.77
South West Oltenia	4,720	3,010	7,200	6,130	5,380	14.0	5,288.0	3.3	29.73
West	800	700	1,540	1,280	2,720	240.0	1,408.0	35.8	57.55

Source: Eurostat data processing, accessed 16.04.2021 [6].

A significant percentage of the total fruit farms with an economic size of less than 2,000 euros are also found in the North-West development region (9,330 farms in 2016). Compared to 2005, the number of these holdings increased by 70.9%, determining an average value for the analyzed period of 8,040 holdings, a positive rate of 14.3% and a coefficient of variation of 29.60%, which indicates a relatively heterogeneous degree of the analyzed data (Table 3).

In the Western development region, the number of fruit farms with an economic size of less than 2,000 euros registered a significant evolution in 2016, compared to the data recorded in 2005. Thus, in 2016 there were 2,720 such fruit farms, with 240 % more than in 2005. For the analyzed period, an average of 1,408 holdings was determined, with a positive rate of 35.8% and a coefficient of variation of 57.55%, which indicates a heterogeneous degree of the analyzed data (Table 3).

A small percentage of the total fruit farms with an economic size of less than 2,000 euros are found in the South-East development region (1,720 farms in 2016). Compared to 2005, the number of these holdings increased by 95.5%, determining an average value for the analyzed period of 1,506 holdings, a positive rate of 18.2% and a coefficient of variation of 51.90%, which indicates a heterogeneous degree of the analyzed data (Table 3).

CONCLUSIONS

The number of fruit farms registered significant oscillations during the analyzed period, depending on their physical size. At the level of 2016, in Romania, there were a total of 67,750 fruit farms, increasing by 70.4% compared to 2005, when there were a total of 39,770 fruit farms.

Analyzing the number of fruit farms classified by physical size, in the period 2005-2016, it can be seen that in 2016 the fruit farms that had a physical size of less than 2 hectares and up to 9.9 hectares are the most representative, covering 98.71% of the total fruit farms in

Romania. Only 1.30% of all fruit farms have an economic size of more than 10 hectares.

With regard to fruit farms where self-consumption exceeds 50% of the production obtained, it can be concluded that most fruit farms with a physical size of less than 2 hectares and up to 20 hectares use the production obtained, in the largest share for own consumption. On the other hand, fruit farms larger than 30 hectares use commercially obtained production and the share in self-consumption is less than 50% of the recorded production volume.

Regarding the number of fruit farms classified according to the development region, in the period 2005-2016 it can be seen that most fruit farms are found in the development regions South-Muntenia (28,130 fruit farms in 2016), North-West (16,670 fruit farms in 2016) and Southwest Oltenia (9,060 fruit farms in 2016). A small number of fruit farms are found in the development regions of Bucharest-Ilfov (260 fruit farms in 2016), South-East (2,570 fruit farms in 2016) and Center region (2,630 fruit farms in 2016).

Regarding the economic size of fruit farms, at national level in 2016, 62.82% of the total fruit farms had an economic size of less than 2,000 euros, 19.42% of the total fruit farms were represented by those farms that had an economic size between 2,000 euros and 3,999 euros, 12.15% were fruit farms with an economic size between 4,000 euros and 7,999 euros and only 3.99% were fruit farms with an economic size between 8,000 euros and 14,999 euros. Less than 1% of fruit farms have an economic size of more than 15,000 euros.

The only solution for the recovery of this sector is the association of fruit growers. Regarding the distribution at county level, of the groups of agricultural producers active in the vegetable-fruit sector, most of the producer groups were registered in the counties of Dambovita (area known for the possibilities of cultivating fruit trees) and Galați (recognized area for the vegetable basins encountered at county level) with 9 and 8 groups of agricultural producers, respectively.

Also, measure 9.1 a. (Which finances the association of farmers in the fruit sector) was not attractive for agricultural producers in the fruit sector, as the number of applicants in the two project submission sessions was quite low. Furthermore, farmers are difficult to persuade to join in groups of producers or cooperatives, so new ways of convincing Romanian farmers to join must be identified.

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