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# THE DYNAMICS OF APPLE-PLANTED AREAS, APPLE PRODUCTION AND APPLE PRICES IN ROMANIA

ANCUȚA MARIN<sup>1</sup>

**Abstract:** *The diversified way of eating apples as well as the versatility of the species that can be cultivated with good results under different environmental and climatic conditions has determined a particular interest for fruit growers. In Romania, apple culture occupies the first place both in terms of surface and production. Current concepts of rational nutrition place fruit consumption in a priority, primarily because they provide the human body with a wide range of vitamins, mineral salts and vital water that are so necessary for the normal physiological activity of the human body. In this paper we are looking at the dynamics of the areas planted with apple during the period 2010-2016, the dynamics of the total and average outputs, as well as the dynamics of the capitalization prices on each county. The purpose of the paper is to make some recommendations that might be useful to Romanian producers who choose apple for their business.*

**Keywords:** *production, apple, production dynamics, capitalization prices*

**JEL Classification:** *Q13, Q11, O13*

## INTRODUCTION

Consumption of fresh or processed fruits (compotes, juices, jams, marmalades) is a necessity for a balanced diet. The efforts made by the World Health Organization to raise awareness of this by every individual on the planet contribute to increasing food security, on the one hand, and to increasing the importance and role of the fruit sector within the agribusiness sector on the other.

Over time, there have been changes in the crop system, species and varieties adapted to new environmental and climatic conditions have appeared. Geneticists in the horticultural field have been focusing on getting more beautiful, more productive and disease resistant fruits, to the detriment of taste. The resulting products have practically created intensive crops, which have increased profits for fruit producers around the world.

The main peculiarities of fruit production are seasonality and perishability. The seasonality of fruit production is given by the succession of the seasons and the growing season specific to each crop. The seasonality of horticultural production, the perishability, the structure and the composition of soils, the changing climate, the favorable areas of culture are a few peculiarities that must be taken into account when setting up an orchard. Add to this the technologies used, fertilizers and pesticides applied to crops.

Due to the vitamins, minerals, carbohydrates, organic acids and fiber they contain, the fruits are true "gold mines" for human health. The positive effects of daily fruit consumption are demonstrated by numerous scientific studies. The purpose of the paper is to make some recommendations that might be useful to Romanian producers who choose apple for their activity.

## MATERIAL AND METHOD

In order to analyze the dynamics of the areas planted with apple, apple production and prices in Romania, the following indicators were used: the area occupied by orchards in Romania, the average apple production per county, the average apple price on county markets and the average consumption of apple per person per year by county.

The research method used is qualitative analysis. Specialized literature has been studied, which highlights the potential of the areas planted with fruit trees - apples, respectively - of the obtained productions and of the capitalization prices. The analyzed period is 2010-2016. The data were taken from the National Institute of Statistics and processed according to the objectives of the paper.

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## RESULTS AND DISCUSSIONS

In order to reduce the deficits and synopes in the supply of fruit from domestic production, it is important to zonate crops, that is, the location of the species, varieties, according to their claims to the climatic and pedological factors.

The climatic conditions in which Romanian plantations are spread are varied and strongly differentiated between them:

- 5-12°C annual average temperatures and
- 350-1.000 mm of annual average precipitation.

Regarding the thermal aspect, more than 90% of the plantations were located in areas with average annual temperatures above 7°C and below 11°C. This range of only 4 degrees represents 1/3 of the country's general thermal range. Dominant are the areas that concentrate in the 8-9°C zone for mesophilous species. The most important fruit-growing areas in Romania are located in the Getic Sub-Carpathians (Southern), the Curb Subcarpathians and the Sub-Carpathians of Moldova (Eastern), where most of the apple orchards, plum and cherry are located. The milder climate in the west of the country is conducive to peach and apricot culture. This area extends along the Danube, in the southern counties Mehedinți, Dolj, Olt, Teleorman to Dobrogea and Constanța-Tulcea respectively. (Table no. 1)

Table no. 1. Characterization of favorable areas for pomiculture

SPECIFICATION	AREA I	AREA II	AREA III
	Most favorable	Favorable area	
Characterization	Cultivated surface approx.50%	Cultivated surface approx.32 %	Cultivated surface approx.18%
Location	S and SE of the country, Subcarpathians of Moldova	West of the country	North and central Transylvania, North of Moldova
Distribution by counties	Mehedinți, Dolj, Olt, Vâlcea, Argeș, Dâmbovița, Prahova, Buzău, Bacău, Constanța, Tulcea	Timiș, Arad, Bihor	Satu Mare, Maramureș, Bistrița-Năsăud, Sălaj, Mureș, Suceava, Neamț
Average annual temperatures	10-11 °C	9-10 °C	8-8,7 °C
Annual average precipitation	400-500 mm	550-700 mm	600-700 mm
Air humidity	55-65%	65-75%	65-80%
Cultivated species	Apple tree, pear tree, plum tree, peach tree, apricot tree, cherry tree	Peach tree, apricot tree, almond tree	Apple tree, pear tree, plum tree, strawberries
Destination of production	Fresh consumption on the domestic and / or external markets		
	Industrialization		

Source: A. Marin et al., Study on the situation of the fruit and vegetable sector at national and community level. Analysis of the short chain of capitalization of fruit production, ASE Publishing House, Bucharest, 2017

The great unevenness between the counties regarding the area with plantations results from the fact that 19 counties (46.34%) have areas with plantations under 2.500 ha and 11 other counties have areas ranging from 2,500 to 5,000 ha. It is worth noting that most of the intensive and superintensive plantations are not located in the areas with the largest areas with plantations (Getic Subcarpathians and Cotmeana Platform), but in the Northwest of Romania and less in the Southwest of the country. So the areas with the largest fruit trees have the most extensive plantations, unfortunately technologically outmoded and therefore uncompetitive.

Compared to the multiannual average of 148.9 thousand ha, the areas under apple orchards have fallen since 2011, with an average of 8.3 ha each year by 2016.

Table no. 2. The evolution of the areas cultivated with apple orchards

Specification	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016
Surface (thousands of ha)	198,6	140,0	142,2	144,1	140,8	138,5	138,0
Deviation from the average	49,7	-8,9	-6,7	-4,8	-8,1	-10,4	-10,9
SPA	2471,5	79,0	44,7	22,9	65,4	107,9	118,5
Variance	411,9	13,2	7,4	3,8	10,9	18,0	19,7
Standard deviation	20,3	3,6	2,7	2,0	3,3	4,2	4,4

Source: NIS data processing

According to the literature, the most popular varieties of apple varieties produced in Romania are: Ardelean, Ciprian, Florina, Frumos de Voinești, Rebra. The highest apple production is recorded in the North-West Region, followed by South Muntenia Region, the lowest production being in the Bucharest-Ilfov Region. As a trend over time, production declined as a general trend (excluding the Northwest Region where it grew), with variations from one year to the next, among the most productive years being 2010 and 2011 (Table 3).

Table 3. Apple production by county (tons)

COUNTY	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016
Alba	9.639	29.269	19.420	23.970	20.768	15.071	12.124
Arad	11.905	7.049	6.784	6.628	5.362	5.244	4.457
Argeș	44.928	57.358	41.987	48.531	44.749	40.671	39.453
Bacău	9.929	9.446	7.047	6.385	8.921	5.601	5.445
Bihor	9.639	29.269	19.420	23.970	20.768	15.071	12.124
Bistrița Năsăud	10.999	31.380	21.521	44.047	39.936	30.013	35.150
Botoșani	19.231	20.196	15.542	17.457	14.120	12.628	11.393
Brăila	1.275	1.822	1.018	1.644	1.734	1.306	1.239
Brașov	1.364	4.312	3.041	3.153	3.240	2.158	3.604
Buzău	19.880	20.949	13.167	16.042	15.970	14.339	13.556
Călărași	661	680	634	832	753	738	729
Caraș Severin	6.349	9.158	7.308	9.692	8.240	7.982	6.753
Cluj	4.847	8.088	5.511	7.955	7.328	7.017	7.294
Constanța	530	931	638	640	927	547	390
Covasna	4.518	5.645	2.980	2.685	3.556	2.803	2.905
Dâmbovița	83.726	63.389	60.809	56.430	41.623	44.690	61.688
Dolj	1.962	2.050	1.839	1.994	2.369	1.642	1.891
Galați	4.825	3.013	2.668	2.091	2.839	3.493	3.422
Giurgiu	1.379	1.545	1.029	1.328	1.504	2.198	1.952
Gorj	4.063	8.011	3.716	6.574	6.305	6.809	6.633
Harghita	3.917	5.942	3.909	4.368	3.925	3.912	2.935
Hunedoara	6.475	10.985	6.639	8.261	7.406	8.163	7.027
Ialomița	119	179	148	287	208	178	181

Iași	10.571	9.273	13.306	10.451	10.527	11.788	10.028
Ilfov	553	566	869	567	566	452	388
Maramureș	42.259	57.629	39.549	37.821	39.306	42.657	33.162
Mehedinți	9.718	11.252	8.139	11.166	8.519	8.943	13.546
Mureș	44.990	26.611	24.531	26.796	38.078	33.258	25.667
Neamț	9.991	13.133	9.241	10.174	10.781	12.114	10.412
Olt	3.850	7.160	3.197	4.357	5.137	5.747	5.858
Prahova	11.717	15.288	12.500	13.175	13.712	14.366	10.966
Sălaj	19.549	24.409	18.193	19.679	27.672	21.655	20.549
Satu Mare	10.829	6.069	5.888	6.023	15.695	15.711	16.448
Sibiu	20.768	10.638	8.500	12.794	11.600	7.522	9.396
Suceava	35.209	49.760	34.517	33.187	37.354	31.460	28.900
Teleorman	715	1.127	643	857	1.054	1.156	949
Timiș	12.543	6.502	3.591	4.349	4.488	5.740	3.894
Tulcea	1.714	2.428	1.403	1.254	1.484	1.353	1.240
Vâlcea	36.129	38.050	26.064	26.859	15.412	14.479	15.886
Vaslui	4.353	5.752	4.943	2.040	8.537	7.844	8.700
Vrancea	12.953	17.360	11.932	11.980	12.714	11.767	12.355
București	192	75	78	40	29	25	25
<b>TOTAL</b>	<b>550.763</b>	<b>633.748</b>	<b>473.859</b>	<b>528.533</b>	<b>525.216</b>	<b>480.311</b>	<b>470.714</b>

Source: NIS data processing

As shown in Table no.3, the county with the largest apple production is Dâmbovița, followed by Argeș, Maramureș and Suceava. The largest apple production in the analyzed range was in 2010 in Dâmbovița County, this being 83,726 tons. Also in this county, in 2014, because of the spring frost, production was almost half, respectively 41,623 tons. In Arges, the best year was 2011 with 57,358 tons and the lowest 2016 with 39,453 tons.

In Maramures, the situation was the same, the year with the highest production being in 2011 with 57,529 tons and the lowest 2016 with 33,162 tons. Suceava County also registered the same trend with 49,760 tons in 2011 and 28,900 tons in 2016 respectively.

As for apple production at country level, Table 4 shows that compared to the multiannual average of 1,272.8 thousand tons, only in 2010, 2011 and 2013 it was higher while in the other years of the series , the recorded productions were below the calculated average (Table no. 4).

Table no. 4. Evolution of total apple production

Specification	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016
Total production (mii tone)	1.419,6	1.480,0	1.128,6	1.299,9	1.115,2	1.224,7	1.241,5
Multi-annual average (mii ha)	1272,8	1272,8	1272,8	1272,8	1272,8	1272,8	1272,8
Deviation from the average	146,8	207,2	-144,2	27,1	-157,6	-48,1	-31,3
SPA	21554,4	42937,8	20789,5	735,2	24833,3	2312,2	978,8
Variance	3592,4	7156,3	3464,9	122,5	4138,9	385,4	163,1
Standard deviation	59,9	84,6	58,9	11,1	64,3	19,6	12,8

Source: NIS data processing

Although it ranks fourth as an apple producer, Suceava County is a "champion" in terms of their sales price in the markets, the average being 3.73 lei/kg. The county with the lowest prices for

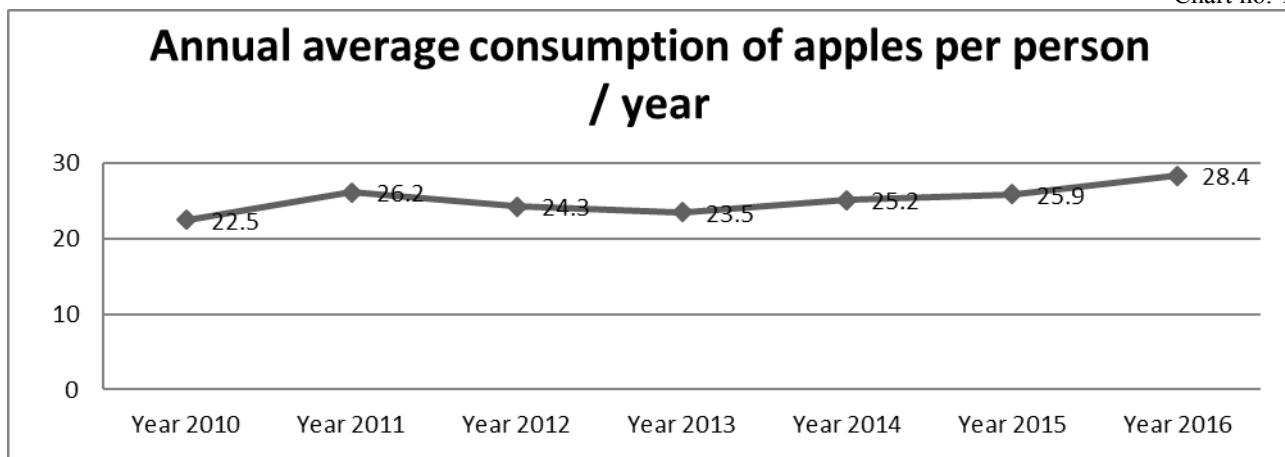
selling apples in the markets is Covasna, where the average was 2.13 lei/kg. The situation presented is an anomaly because the rule is at high production low price and vice versa (Table no 5).

Table no. 5. Average price for capitalization of apples by county (lei/kg)

<i>County</i>	<i>Year 2013</i>	<i>Year 2014</i>	<i>Year 2015</i>	<i>average</i>
Suceava	3,81	3,71	3,68	3,73
Călărași	3,43	3,61	3,66	3,57
Constanța	2,98	3,79	3,78	3,52
Tulcea	3,69	3,44	3,21	3,45
București	3,47	3,06	3,29	3,27
Teleorman	3,21	3,22	3,29	3,24
Timiș	3,31	3,15	3,01	3,16
Neamț	3,35	2,95	2,81	3,04
Bihor	3,16	2,92	2,87	2,98
Arad	3,36	2,63	2,88	2,96
Vrancea	3,06	2,71	3,08	2,95
Gorj	3,04	3,02	2,76	2,94
Iași	3,01	2,95	2,86	2,94
Alba	2,97	2,78	2,99	2,91
Giurgiu	3,02	2,84	2,83	2,90
Harghita	3,05	2,91	2,65	2,87
Hunedoara	2,85	2,66	3,05	2,85
Brașov	2,81	2,89	2,82	2,84
Buzău	3,29	2,52	2,66	2,82
Mehedinți	2,64	2,82	2,97	2,81
Prahova	2,96	2,55	2,84	2,78
Cluj	2,85	2,58	2,91	2,78
Olt	2,73	2,84	2,73	2,77
Argeș	2,64	3,02	2,58	2,75
Mureș	2,73	2,58	2,86	2,72
Caraș Severin	2,74	2,79	2,61	2,71
Galați	2,01	2,93	3,19	2,71
Ialomița	2,59	2,67	2,83	2,70
Braila	2,75	2,31	2,75	2,60
Dâmbovița	2,57	2,61	2,57	2,58
Bacău	2,63	2,39	2,68	2,57
Maramureș	2,56	2,61	2,41	2,53
Vâlcea	2,37	2,36	2,83	2,52
Satu Mare	2,63	2,21	2,41	2,42
Bistrița Năsăud	2,57	2,32	2,31	2,40
Sibiu	2,32	2,29	2,58	2,40
Sălaj	2,32	2,29	2,58	2,40
Vaslui	2,21	2,56	2,25	2,34
Botoșani	2,38	2,37	2,17	2,31
Dolj	2,38	2,17	2,11	2,22
Covasna	2,25	2,08	2,05	2,13

Source: NIS data processing

Analyzing data from the 2010-2016 period the average consumption of apples per year/person increased by 5.9 kg which means 26.22% (Chart no. 1).



Source: NIS data processing

In our country, in the last years, there is a change, on a scientific basis, of the mentality of the population. Fruits contribute substantially to balancing dietary ratios, their consumption, especially fresh, preventing diseases caused by sedentary, stress and other factors that negatively affect the life of modern humans.

### CONCLUSIONS

By their content of vitamins, carbohydrates and minerals, fruits contribute to maintaining and increasing the health of the population. Therefore, they must be an important part of the daily human food requirement. In our country, in the last years, there is a change, on a scientific basis, of the mentality of the population. Fruits contribute substantially to balancing dietary ratios, their consumption, especially fresh, preventing diseases caused by sedentary, stress and other factors that negatively affect the life of modern humans.

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