

Marin, Ancuța

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

ANCUȚA MARIN¹

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.

¹ PhD. Ec. Ancuța Marin – Third-grade Scientific Researcher, Research Institute for the Economy of Agriculture and Rural Development, marin.ancuta@iceadr.ro

RESULTS AND DISCUSSIONS

In order to reduce the deficits and syncope 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 |
|------------------------------|--|---------------------------------------|---|
| Characterization | Most favorable | Favorable area | |
| | 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 |
| TOTAL | 550.763 | 633.748 | 473.859 | 528.533 | 525.216 | 480.311 | 470.714 |

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

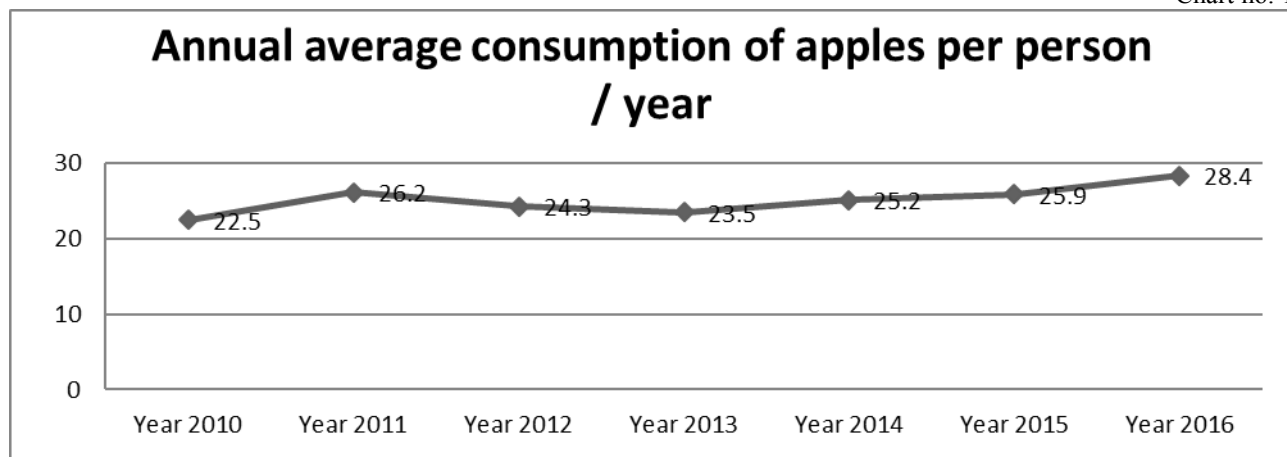
selling apples in the markets is Covasna, where the average was 2.13 lei/kg. The situation presented is an anomaly because the rule is at high production low price and vice versa (Table no 5).

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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