

THE DIMENSIONING OF THE FRUIT-GROWING PATRIMONY IN ROMANIA

by
**Mihaela Jaradat, Florin Urs
Sabina Funar**

Abstract. In this paper, we present the dimensioning of the fruit-growing patrimony in Romania performed with the help of polynomial equations of superior order.

Introduction

Romania is one of the European countries in which fruit growing is well represented by the culture of a diversity of species and varieties that find favourable climatic conditions for growth and fructification, assuring fruit consumption spread out along the whole year.

The millenary tradition of fruit-tree cultivation as well as its extension on larger areas made fruit growing one of the fundamental branch of agriculture, with a well-defined infrastructure acknowledged both on home and foreign markets.

We should understand fruit-growing patrimony as: "Not only the number of fruit-trees and the area covered by them, but also the ecological background, i.e. favourableness of the climatic conditions and the production capacity of the soil under plantations (the determining factors of the fruit-tree production potential)¹.

Sources and methods

This paper used as a source the statistical data found in The Romanian Annual (the part concerning the socio-economic conditions of Romania in various periods), offered by the National Institute of Statistics. Another source used in this paper is National Commission of Statistic and the Ministry of

¹ Teaci D., Puiu S., Amzar Gh., Voiculescu N., Popescu I., The influence of the Environment Conditions upon Fruit-tree Growing in Romania, Ed Ceres, Bucharest, 1985, p. 238.

Agriculture, Food and Forest- department of operational data The periods cover seventy-two years segmented at every eleven, twelve years, following four consecutive decades and concluding with two intervals of seven, respectively two years, as follows: the dimensioning of fruit-tree patrimony was performed with the help of polynomial equations of superior order, in most of the cases the six order equations. The used research methods were a series of numerical characteristics (predefined in mathematics), namely the mathematical mean or the mathematical hope, the linear mean deviation, the root-mean-square deviation, the Pearson coefficient of variation, interval of confidence, the Kurtosis coefficient, asymmetry (the Fisher coefficient).

The evolution of the fruit-growing patrimony during the mentioned period was mathematically modelled with the help of the polynomial function $y = 0.2867x^6 + 9.0687x^5 - 110.78x^4 + 651.99x^3 - 1877.3x^2 + 2382.3x - 715.94$

whose graphic presentation can be seen in Figure 1.

Results and debates

The evolution of the Romanian fruit-growing patrimony in the course of time is presented in Table 1 and Figure 1, and the mathematical results obtained from the numerical characteristics are presented in Table 2.

Table 1 The Romanian fruit-growing patrimony.

Year	1927	1938	1950	1960	1970	1980	1990	1997	1999
Area	340.1	247.0	184.2	212.6	428.4	359.6	313.6	245.5	239.9

(thousands ha)

Table 2 The mathematical results obtained from the numerical characteristics.

Mean (The mathematical hope)	285.66
Linear mean deviation (ha)	66.46
Root-mean-square deviation (ha)	79.39
The Pearson coefficient of variation	27.79
Estimation of the mean area of fruit-growing patrimony during 1927-1999 in terms of the interval of confidence, with an error probability of 5% (ha)	51.87
The Kurtosis coefficient	-0.54
Asymmetry (the Fisher coefficient)	0.59

The statistical data show that the area covered with fruit trees varied in the course of time, decreasing from 340,100 ha in 1927 to 184,000 ha in 1950, after which, as a result of a massive planting campaign, it increased to 428,400 ha in 1970. After that it decreased to approximately 240,000 ha in 1999.

In the nine years recorded by the last two periods, the fruit-growing patrimony mean area is of 286.66 thousand ha, being almost at the limit of unrepresentativeness as it results from the calculation of the Pearson coefficient of variation which is 27.79%.

That shows the important variations of the total area covered which fruit trees between 1927 and 1999. The negative value of the Kurtosis coefficient (-0.54; table 2) consolidates our view concerning the unrepresentativeness of the mean value for the sample, implicitly for the whole period.

In order to find out the limits in which the annual average area of the fruit-growing patrimony was situated, we made an estimation in terms of the interval of confidence specifying an error probability of 5% (warrant probability of 95%). The results for the period of last fifty years, within the studied period, was an interval ranging between 233.79 and 337.53 thousand ha. The fact that the lower limit of range is very close to existing area suggests on one hand that the selected sample (the nine years) is representative, and on the other hand it indicates that the fruit-growing patrimony became stable on an area of about 240 thousand ha, during the last years.

Nevertheless, it cannot be statistically proved that in period between 1927 and 1999 the series of data dominant (modal value) approximates the value of 240 thousand ha. The Fisher asymmetry coefficient of 0.59 (table 2) suggests a positive asymmetry ranging from a slight to a well-marked one. Thus the modal value can be calculated according to the formula suggested by K. Pearson:

$$M_0 = 3M_e - 2V_m = 170 \text{ thousand ha}^{23}$$

In conclusion, it is difficult for us to confirm that area of 240 thousand ha is dominant in the period of 1927-1999.

The complex reality, the multitude of situations that occurred during the last fifty years determined the evolution of the fruit-growing patrimony as it is

² Merce E., Urs Fl., Merce C., Statistica, Editura AcademicPress, Cluj-Napoca, 2001, p.75.

³ M_0 =modal value, M_e =median value, V_m =mean value

presented in Figure 1. In order to establish the tendency line we resorted to the family of superior degree polynomial equation. The polynomial function of six orders is a valid instrument in pointing out the tendency of the fruit-growing patrimony in the specified period, having the value of $R^2 = 0.8854$ ⁴ (Figure 1)

The evolution of the in bearing orchards in Romania is another aspect that we bring into discussion.

The proportion of the fruit-tree plantations (in bearing orchards) within the agricultural area of the country decreased continuously, from 1.61 % in 1989 to 1.32 % in 2000 (Table 3). In bearing orchards represented an average of 79.46% of the total fruit-growing patrimony in the period 1989-2000 (Table 4 and Figure 2). In bearing orchards showed a constant decreasing tendency with a short variation from the average (Table 4 and Figure3), the Pearson coefficient of variation of 5.53% regarding the areas (Table 4) and of 3.8% regarding the number of fruit-tree (Table5) bringing a confirmation of the fact.

Compared to 1989, in the year 2000 the areas of in bearing orchards represented 81.42% of the fruit-growing patrimony (Table 4) and taking into consideration the number of fruit-trees it represented 86.77% (Table 5). The yearly mean rhythm of decrease during the analysed period was of 1.77% (Table 4)⁵.

⁴ the veracity of the tendency line: a tendency line is more veracious when the root-mean-square deviation is equal or almost equal to 1. (R root: is an indicator from 0 to 1 that shows how exactly the estimated values for the tendency line correspond to the existing data. A tendency line is closer to the truth when the R root is equal to 1 or closer to 1, it is also known as the determining coefficient)

⁵ the calculus of the average rate was done having as a starting point the mean index of the analyzed period, which was calculated using the method of autoregressions, according to the

relation $I_y = \frac{\sum_{k=2}^n Y_k Y_{k-1}}{\sum_{k=2}^n Y_{k-1}^2}$ thus taking into account all the terms of the series and grasping all

the autoregressive movements (from one term to another)

Merce E., Urs Fl., Merce C., Statistics, Ed. AcademicPres, Cluj-Napoca, 2001, p.249.

During 1927-1980 the total fruit production registered a multiannual average of 1139.6 thousand tonnes (Table 6) which an index of 102.66% in the year 1980 compared to year 1938 (Table 6). As a Pearson coefficient of variation is of 29.49% we can consider the annual average at the limit of representative ness for the analysed period. Approximately, the same situation existed in the case of the production of the in bearing orchards (the production of fruit bushes and of strawberries is subtracted from the total fruit production).

The tendency line of the total fruit production can be expressed by means of a polynomial equation of six order ($R^2 = 0.862$), due to the existence of important variation in the period 1927-1950. After the year 1950 the total fruit production in Romania increased continuously until the year 1980. The production of the year 1938 was exceeded in the year 1977 (Table 6 and Figure 4).

In the last period of the 20th century the fruit production in Romania registered important variations, as a matter of fact a veridic tendency line to express the evolution in the period 1989-2000 did not exist. A $R^2 = 0.3517$ (Figure 5) was calculated for the polynomial equation of six order confirming an uncontrolled extremely varied evolution of fruit production. The Pearson coefficient of variation 31.2% proves the important variation of fruit production in the period 1989-2000 once more (Table 7).

At the beginning of the period (1989, 1990) and mainly in the year 1993, as well as in the year 1996 and the year 1997 the production was situated above the average. In the rest of the years the fruit production in Romania registered low levels and lately even worrying ones.

Compared to the year 1989, in the year 2000 the fruit production decreased with about 49%. The average annual rate of decrease was of 12.6-12.7% (Table 7).

During the whole period the average production per hectare were much under 10 t per hectare, having a very low level in the year 2000 (3872 kg/ha) and an average of the period of 5612 kg/ha which is unrepresentative, the Pearson coefficient of variation is 40.4%, indicating an important variation (Table 8). Compared to the year 1989, in the year 2000 the average production per hectare decreased to 59.7%, having an average annual rate of the period of -11.4%.

Conclusions

1. The decreasing tendency can be expressed by means of a three-dimensional polynomial equation with $R^2 = 0.9594$, (Figure 3) which shows that selected regression pattern was representative. If the bearing orchards follow the same regression curve, their area will decrease to about 150 thousand hectares in the year 2004 (Figure3).
2. If we compare the average annual rates of the in bearing orchards having in mind the area the total productions and the average production (Table 4, 7, 8), we can see that the areas decreased less (-1.77%). We can draw the conclusion that the decrease of the total fruit production (-12.7%) was almost entirely due to the decrease of the average productions per hectares (with an average annual rate of -11.4%)
3. Comparing the average fruit production in Romania to those of UE member countries (Table 9 and 9') we can notice that in some countries, as Belgium, France and Holland, the average fruit production exceeds three times up to nine times the average fruit production in Romania, while in others, as Spain for example, the average total fruit productions were under 500kg/ha, in the period 1997-2000.

Table 3 . The proportion of the fruit-growing plantations from the agricultural area.

x.	9)	1989	1997	1998	1999	2000
a.	α.	239.5	214.0	211.8	208.9	195.0
v.	α.	14759	14748	14746	14782	148.10
y.	%	<u>1.61</u>	<u>1.45</u>	<u>1.44</u>	<u>1.42</u>	<u>1.32</u>

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Table 4. The dynamic of the structure of fruits-growing patrimony in the last period of the 20th century

Year	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	p.	q.	r.	s.	t.
1989	239.50	96.60	9.00	77.30	20.50	8.50	21.50	3.80	2.30	3.40	6.90	2.60	7.51	30.30	6.23	42.70	3.47	5.30	347.91
1990	230.70	90.80	8.70	101.10	8.00	6.70	11.50	2.40	1.50	3.30	5.00	2.60	5.48	23.88	3.18	40.84	2.19	0.52	293.81
1991	232.79	89.40	8.50	102.90	7.80	6.65	13.20	3.01	1.33	2.90	3.50	2.40	3.20	24.75	2.43	36.78	1.02	0.54	310.31
1992	230.40	88.70	8.40	101.10	7.40	6.60	13.40	2.80	2.00	2.30	2.10	2.20	6.43	20.46	1.92	32.99	0.40	0.40	299.60
1993	233.20	88.30	8.10	104.80	7.50	6.50	13.40	2.70	1.90	1.60	1.80	2.00	8.97	18.49	1.00	28.65	0.28	0.38	296.37
1994	228.60	87.60	8.00	101.50	7.20	6.40	13.10	2.50	2.30	1.10	1.60	1.80	9.45	19.92	1.96	23.67	0.26	0.26	288.62
1995	255.94	85.60	7.55	102.10	6.39	6.06	13.37	2.51	2.36	0.70	1.30	1.60	7.96	16.79	0.93	17.60	0.10	0.33	273.25
1996	218.24	81.50	7.20	100.20	5.90	6.03	12.99	2.37	2.05	0.40	1.40	1.40	7.59	18.24	0.49	14.00	0.10	0.27	262.13
1997	214.99	81.00	6.66	98.60	5.32	5.81	13.30	2.33	1.97	0.40	1.30	1.30	9.60	18.12	0.24	11.47	0.10	0.17	257.69
1998	211.79	79.50	6.48	99.20	5.02	5.48	11.99	2.37	1.75	0.30	1.40	1.30	8.95	17.85	0.42	10.53	0.03	0.30	252.87
1999	208.90	77.98	6.36	98.78	5.14	5.16	11.50	2.42	1.56	0.30	1.50	1.80	7.51	18.95	0.20	9.63	0.03	0.33	249.15
2000	195.00	71.20	6.0	95.70	3.60	4.40	10.50	2.10	1.50	0.51	1.60	1.50	2.98	16.90	0.22	8.44	0.01	1.20	228.36
1)	222.50	84.85	7.58	98.61	7.48	6.19	13.31	2.61	1.88	1.43	2.45	1.88	7.14	20.07	1.60	23.11	0.67	0.83	280.01
2)	12.31	6.57	0.98	6.80	4.13	0.96	2.64	0.43	0.33	1.17	1.71	0.46	2.15	3.85	1.68	12.31	1.04	1.37	31.18
3)	5.53	7.74	12.87	6.90	55.24	15.5	19.81	16.32	17.84	81.73	69.86	24.65	30.07	19.20	105.10	53.26	15.6	164.46	11.13
4)	81.42	73.71	66.67	123.80	17.56	51.8	48.84	55.26	65.22	15.00	23.19	57.69	39.68	55.78	3.53	19.77	0.29	22.64	65.64
5)	-1.77	-	-3.46	1.19	-	-6.32	-	-7.92	-	-	-	-6.00	-7.86	-25.6	-	-	-42.5	-85.44	-4.06
7)	79.46	30.30	2.71	35.22	2.67	2.21	4.75	0.93	0.67	0.51	0.7	0.67	2.55	7.17	0.57	8.25	0.24	0.30	100
8)												0.73	0.17	0.645	0.73	0.87			

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Table 5. The structure of the fruit-growing patrimony in the period 1989-2000, according to the number of fruit-trees.

Year	a.		b.		c.		d.		e.		f.		g.		h.		i.		e.
	β	%	β	%	β	%	β	%	β	%	β	%	β	%	β	%	β	%	β
1989	132.184	100	50.894	38.5	5.732	4.3	49.563	37.5	6.184	4.7	4.781	3.6	8.950	6.8	2.368	1.8	3.712	2.8	11.917
1990	124.249	100	49.877	40.1	5.199	4.2	44.661	35.9	5.882	4.7	4.782	3.8	8.891	7.2	2.070	1.	2.967	2.4	9.83
1991	126.053	100	49.980	39.6	5.096	4.0	44.927	35.6	7.159	5.7	5.132	4.1	8.824	7.0	1.922	1.5	3.013	2.4	7.291
1992	127.716	100	51.127	40.0	5.136	4.0	46.577	36.5	6.506	5.1	4.800	3.8	8.896	7.0	1.932	1.5	2.742	2.1	6.447
1993	124.100	100	50.147	40.4	5.196	4.2	45.802	36.9	5.009	4.0	4.452	3.6	8.775	7.1	1.939	1.6	2.780	2.2	5.186
1994	124.289	100	50.865	40.9	5.099	4.1	46.284	37.2	4.831	3.0	4.237	3.4	8.453	6.8	1.905	1.5	2.615	2.1	4.270
1995	122.640	100	49.531	40.4	4.908	4.0	46.120	37.6	4.364	3.6	4.279	.35	8.896	7.3	1.937	1.6	2.605	2.1	2.216
1996	120.176	100	48.131	40.1	4.649	3.9	46.158	38.9	4.046	3.4	4.112	3.4	8.439	7.0	2.138	1.8	2.494	2.1	2.921
1997	118.827	100	47.668	40.1	4.371	3.7	45.953	38.7	3.610	3.0	3.914	3.3	8.750	7.4	2.097	1.8	2.484	2.1	2.142
1998	118.424	100	46.188	39.0	4.336	3.7	46.295	39.1	3.589	3.0	4.709	4.0	8.771	7.4	2.103	1.8	2.433	2.1	1.520
1999	128.209	100	48.909	38.1	4.793	3.7	52.920	41.3	3.561	2.8	4.145	3.2	8.957	7.0	2.101	1.6	2.823	2.2	1.345
2000	114.700	100	44.400	38.7	4.300	3.7	46.600	40.6	2.900	2.5	3.800	3.3	8.000	7.0	2.300	2.0	2.400	2.1	1.081
1)	123.275	100	48.936	39.7	4.884	4.0	46.772	38	4.629	3.8	4.405	3.6	8.712	7.1	2.63	1.7	2.736	2.2	3.506
2)	4657.4	0.0	1968.8	0.8	411.8	0.2	2168.0	1.7	1303.6	1.0	388.4	0.3	271.7	0.2	144.9	0.1	347.1	0.2	3313.4
3)	3.8	0.0	4.0	2.1	8.4	5.4	4.6	4.4	28.2	25.4	8.8	7.3	3.1	2.7	7.0	8.5	12.7	9.3	94.5
4)	86.77		87.24		75.02		94.02		46.90		79.48		89.39		97.13		64.66		9.07
5)	1.4E+00		-1.22		-2.82		-0.8198		-6.09		-2.26		-1.04		-0.55		-5.20		-20.83

Table 6. The fruit production in Romania in various years between 1927 and 1980

Year	u.		a.		From which																j.		k.		
	φ	%	φ	%	b.		c.		d.		e.		f.		g.		h.		i.		φ	%	φ	%	
					φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%					
1927	1036.9	100	1036.9	100	***		***	10.0	553.6	53.4	***		***		***		39.7	3.83	***	***	***		***		
1938	1380.9	100	1380.9	100	566.5	41.0	138.7	3.7	272.9	19.8	15.0	1.09	80.5	5.8	119.5	8.65	128.5	9.31	59.3	4.3	***		***		
1950	401.1	100	384.4	95.8	76.4	19.0	14.7	5.4	230.5	57.5	1.5	0.37	7.2	1.8	23.2	5.78	17.8	4.44	29.8	7.4	***		***		
1960	843.	100	829.5	98.3	111.1	13.2	45.8	4.7	496.5	58.8	5.5	0.65	24.9	3.0	55.8	6.61	48.6	5.76	41.3	4.9	***		14.4	1.7	
1965	1157.5	100	1135.7	98.1	216.8	18.7	54.5	4.6	694.8	60.0	12.8	1.11	21.1	1.8	35.8	3.09	41.3	.357	58.6	5.1	***		21.8	1.9	
1970	1173.7	100	1142.2	97.3	175.8	15.0	53.9	7.4	697.1	59.4	28.6	2.44	46.5	4.0	61.1	5.21	32.6	2.78	46.6	4.0	***		31.5	2.7	
1975	1101.2	100	1078.2	97.9	314.9	28.6	81.4	4.9	414.2	37.6	64.7	5.88	6.3	5.7	59.2	5.38	25.5	2.32	55.3	5.0	***		23.0	2.1	
1976	1349.9	100	1320.7	97.8	469.7	34.	66.2	6.7	566.7	42.0	65.1	4.82	34.5	2.6	52.7	3.9	30.0	2.22	35.8	2.7	***		29.2	2.2	
1977	1455.0	100	1425.3	98.0	593.4	40.8	97.0	6.1	510.2	35.1	52.8	3.63	57.1	3.9	47.4	3.26	30.6	2.1	36.8	2.5	***		29.7	2.0	
1978	1315.7	100	1287.3	97.8	359.4	27.3	80.2	6.2	602.4	45.8	73.2	5.56	33.5	2.5	66.6	5.06	30.4	2.31	41.6	3.2	***		28.4	2.2	
1989	1805.8	100	1777.8	98.4	594.0	32.9	111.3	5.8	782.6	43.3	40.3	2.23	31.6	1.7	96.2	5.33	43.6	2.41	78.2	4.3	***		28.0	1.6	
1990	1417.6	100	1382.5	97.5	413.9	29.2	82.2	5.8	621.1	43.8	58.1	4.1	35.3	2.5	72.2	5.09	37.0	2.61	62.7	4.4	1.5	0.1	33.6	2.4	
1)	1139.6	100	1117.8	98.1	294.1	25.6	66.1		50.8	44.6	24.3	2.1	33.8	2.9	57.6	5.0	37.1	3.3	47.8	4.2	1.5	0.1	27.9	2.0	
2)	336.09		346.44		191.11		33.78		166.38		26.37		20.80		26.71		28.5		14.44					3.99	
3)	29.49		30.99		64.99		51.11		32.77		108.63		61.56		46.37		76.7		30.22		0.00			14.3	
6)	102.66		100.12		73.06		59.3		227.59		387.33		43.85		60.42		28.8		105.7						

Table 7. The fruit production in Romania in the last period of the 20th century

Year	u.		a.		From which												j.		k.					
					b.		c.		d.		e.		f.		g.		h.		i.					
	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%	φ	%
1989	1583.5	100	1550.6	97.9	697.4	44.0	83.4	5.3	493.8	31.2	81.0	5.12	49.7	3.14	79.9	5.0	24.4	1.5	41.0	2.59	3.3	0.2	29.6	1.9
1990	1455.5	100	1434.8	98.6	683.2	46.9	73.8	5.1	449.5	30.9	52.9	3.63	48.0	3.3	67.7	4.7	26.0	1.8	33.7	2.32	2.5	0.2	18.2	1.3
1991	1167.3	100	1150.9	98.6	504.9	43.3	58.1	5.0	418.9	35.9	43.6	3.74	26.0	2.23	59.6	5.1	18.0	1.5	21.8	1.87	2.6	0.2	13.8	1.2
1992	1168.8	100	1154.2	98.8	541.1	46.3	63.1	5.4	346.7	29.7	37.3	3.19	40.7	3.48	73.0	6.2	21.8	1.9	30.5	2.61	1.8	0.2	12.8	1.1
1993	2164.6	100	2155.7	99.6	1097.2	50.7	108.5	5.0	703.7	32.5	49.7	2.3	41.7	1.93	106.4	4.9	32.6	1.5	15.9	0.73	1.6	0.1	7.3	0.3
1994	981.6	100	968.1	98.6	363.0	37.0	51.1	5.2	385.7	39.3	20.9	2.13	34.6	3.52	70.4	7.2	19.5	2.0	22.9	2.33	1.2	0.1	12.3	1.3
1995	918.3	100	904.7	98.5	457.2	49.8	63.0	6.9	252.5	27.5	13.4	1.46	15.3	1.67	60.5	6.6	22.8	2.5	20.0	2.18	0.9	0.1	12.7	1.4
1996	1632.4	100	1620.1	99.2	659.7	40.4	64.2	4.5	663.0	40.6	25.9	1.59	43.8	2.68	89.3	5.5	35.7	2.2	28.5	1.75	0.7	0.0	11.6	0.7
1997	1417.2	100	1403.3	99.0	664.1	46.9	69.9	4.9	491.6	34.7	17.4	1.23	27.6	1.95	73.8	5.2	32.9	2.3	26.0	1.83	0.4	0.0	13.5	1.0
1998	1036.7	100	1024.6	98.8	364.6	35.2	64.5	6.2	404.4	39.0	17.9	1.73	37.0	3.57	76.9	7.5	32.5	3.1	25.8	2.49	0.3	0.0	11.8	1.1
1999	938.8	100	919.8	98.0	316.1	33.7	63.8	6.8	364.6	38.8	16.4	1.75	31.6	3.37	71.8	7.6	31.2	3.3	24.3	2.59	0.3	0.0	18.7	2.0
2000	769.8	100	758.0	98.5	360.3	46.8	27.1	3.5	316.6	41.1	11.6	1.51	7.8	1.01	27.2	3.5	3.5	0.5	3.9	0.51	0.2	0.0	11.6	1.5
1)	1217.8	100	1201.6	98.7	524.3	43.1	63.8	5.2	423.8	34.8	27.0	2.2	30.4	2.05	68.5	5.6	22.3	1.8	21.9	1.8	0.9	0.1	13.7	1.1
2)	379.5		379.1		210.9		18.4		127.3		20.2		12.2		18.0		8.6		8.9		1.0		5.4	
3)	31.2		31.5		40.2		28.9		30.0		74.8		40.3		26.3		38.6		40.5		109.6		19.3	
4)	48.6		48.9		51.7		32.5		64.1		14.3		15.7		34.0		14.3		9.5		6.1		19.2	
5)	-12.6		-12.7		-16.6		-12.0		-12.5		-25.0		-17.3		-9.0		-11.3		-16.6		-19.2		19.3	

Table 8. Productivity of the cultivated fruit-growing species in Romania

Year	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
1989	6490	72.19	9267	6388	39.54	5847	3716	6421	16391	970	4290
1990	6209	75.23	8483	4446	6612	7164	5887	10833	20867	757	3640
1991	4933	56.48	6835	4071	5590	3880	4515	6000	14692	896	3943

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1992	5016	61.00	7515	3429	5040	6167	5703	7786	14350	782	6095
1993	9320	12426	13395	6715	6626	6415	7940	12074	17474	1000	4055
1994	4230	4144	6387	3820	2903	6406	5374	7800	8565	1091	7687
1995	4001	5344	8400	2473	2127	2508	4515	9120	7916	1286	9769
1996	7420	8094	10305	6617	4465	7300	6869	14875	13190	1750	8286
1997	6554	8199	10433	4986	3226	4758	6000	14304	12800	1000	10385
1998	4894	4586	9923	4077	3580	6727	6492	13541	13882	1000	8428
1999	4400	4052	10127	3690	3216	6077	6243	13000	16750	1000	12467
2000	3872	5075	4517	3277	3222	1773	2590	1667	2600	468	7197
1)	5612	6534	8799	4499	4213	5419	5487	9785	13290	1000	7187
2)	1564	2265	2222	1336	1406	1732	1397	3841	4705	296	2743
3)	40.4	44.6	49.2	40.8	43.6	97.7	53.9	230.4	181.0	63.3	38.1
4)	59.7	70.3	48.7	51.3	81.5	30.3	69.7	26.0	15.9	48.2	167.8
5)	- 11.4	-14.8	-9.9	-15.1	-8.4	-151	-6.3	-10.8	-13.6	-7.6	-3.6

Table 9. Area, production to ha and production total in UE member country, to fruit
between 1994 and 1997

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Specification	Area thousand ha					Production to ha Kg/ha					Production total Thousand tone				
	1994	1995	1996	1997	97/96 %	1994	1995	1996	1997	97/96 %	1994	1995	1996	1997	97/96 %
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total fruit UE	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Belgium	16	16	16	16	0,0	45200	45100	31100	:	×	705	721	498	:	×
Denmark	:	:	5	7	40,0	:	:	8200	:	×	...	:	41	:	×
Germany	:	:	:	:	×	:	:	:	:	×	...	:	:	:	×
Greece	:	:	:	:	×	:	:	:	:	×	2259	:	:	:	×
Spain	:	1130	1124	:	×	:	3400	4000	:	×	4264	3894	4471	:	×
France	241	230	226	221	-2,2	16000	16200	16500	15900	-3,9	3846	3716	3733	3509	-6,0
Ireland	:	:	:	:	×	:	:	:	:	×	:	:	:	:	×
Italy	:	:	:	:	×	:	:	:	:	×	7949	:	:	:	×
Luxemburg	:	:	0	0	0,0	:	:	:	:	×	12	8	11	6	-45,5
Holland	26	25	25	25	0,0	26900	29800	24400	24000	-1,6	705	745	610	600	-1,6
Austria	:	:	:	:	×	:	:	:	:	×	189	199	200	226	13,0
Portugal	153	1508	147	:	×	3800	:	4000	:	×	581	548	589	681	15,6
Finland	6	8	8	8	0,0	2200	1800	2100	2000	-5,9	14	14	17	16	-5,9
Sweden	6	6	6	6	0,0	:	5500	5300	5300	0,0	33	33	32	32	0,6
Great Britain	33	30	29	28	-3,4	12900	12500	12800	8200	-35,6	427	376	370	230	-37,8

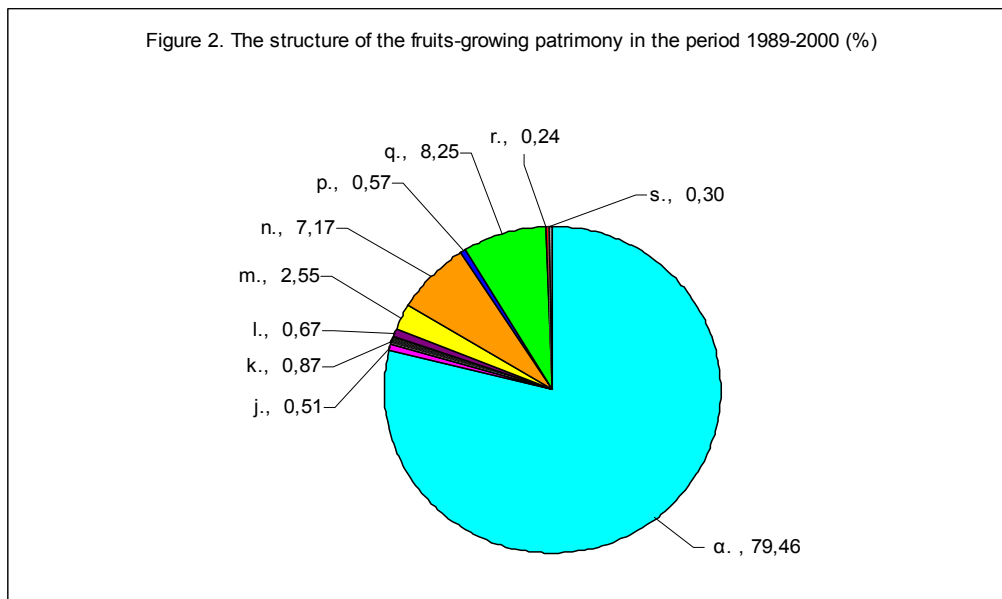
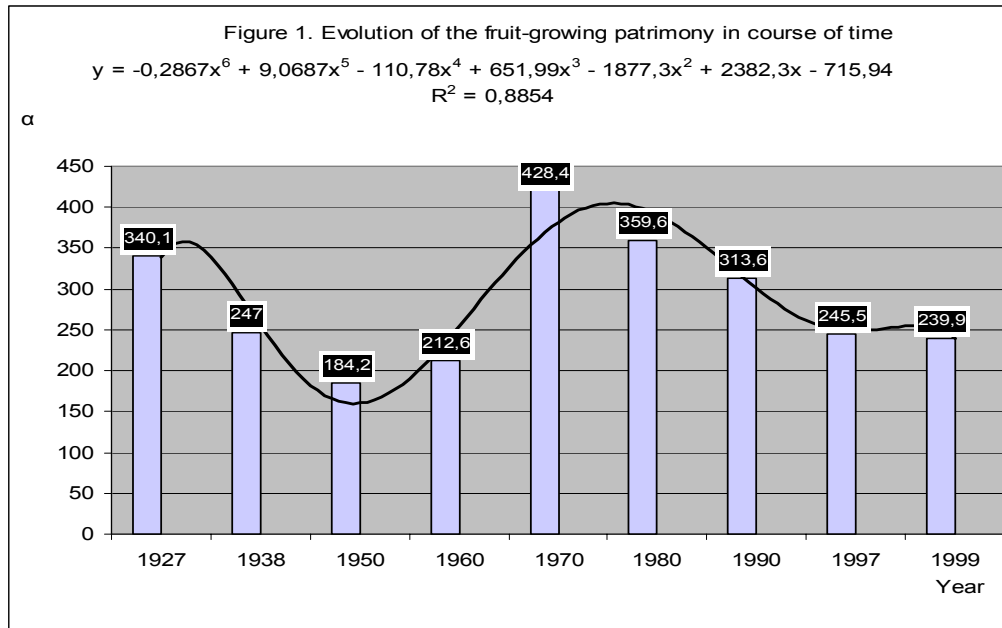
Sours: The Agricultural Situation in the European Union, 1998, Report, European Commission, Brussels • Luxembourg, 1999, pages 238-240.

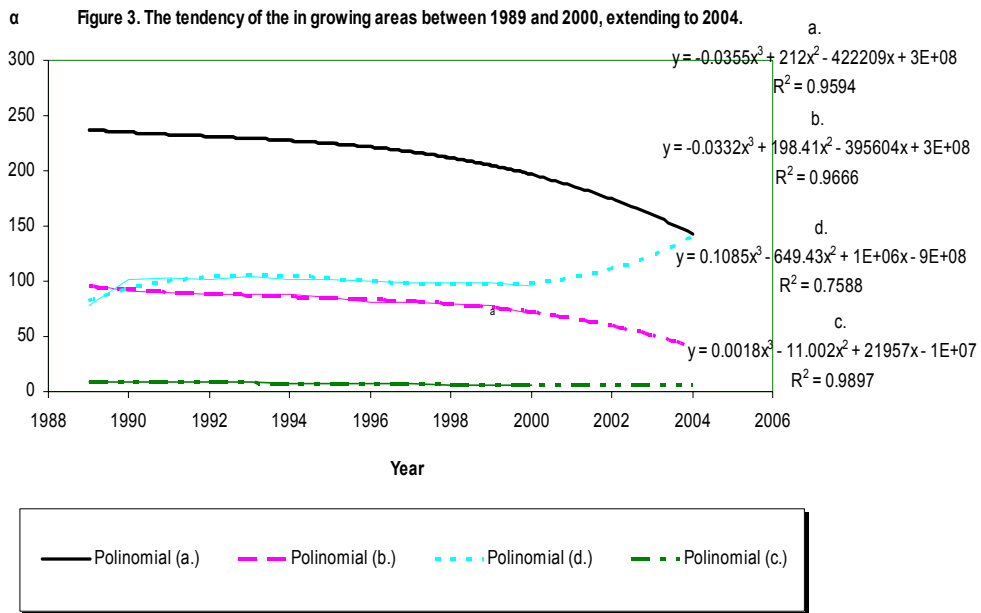
Table 9' Area, production to ha and production total in UE member country, to fruit between 1997 and 2000

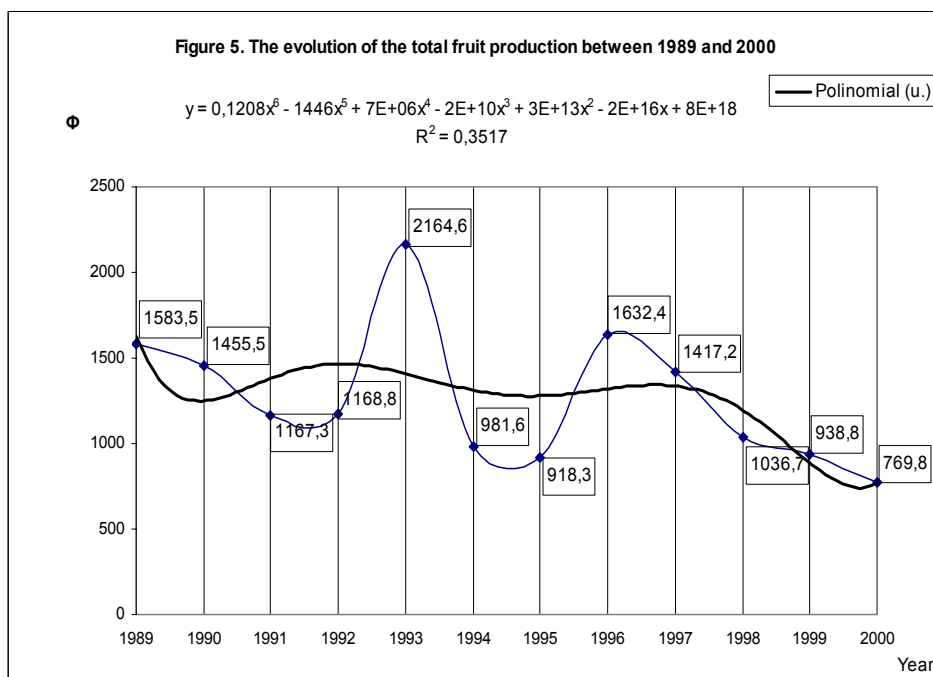
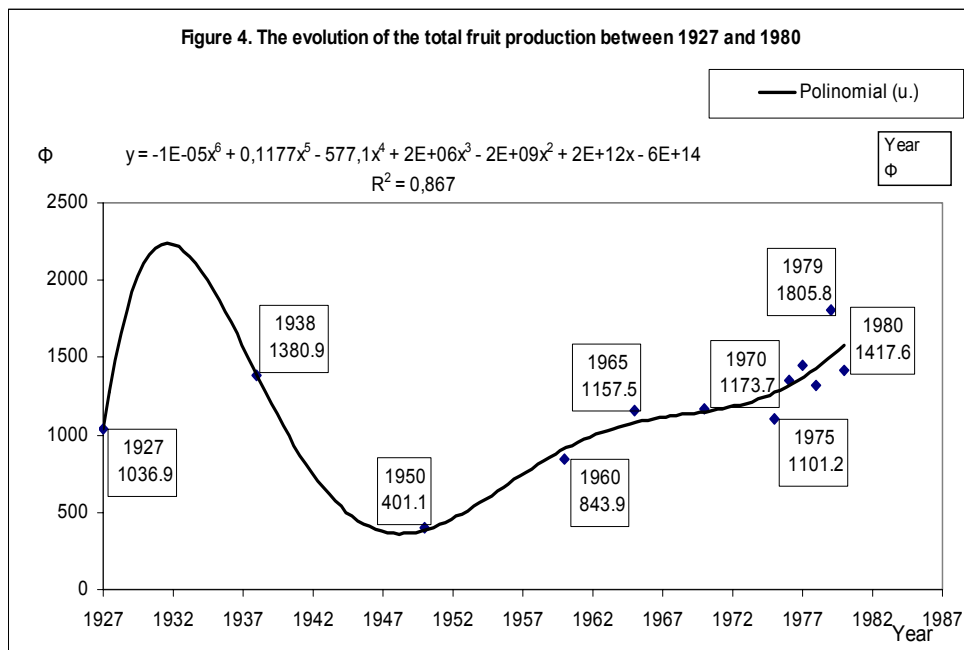
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Specificati on	Area thousand ha					Production to ha Kg/ha					Production total Thousand tone				
	1997	1998	1999	2000	00/99 %	1997	1998	1999	2000	00/99 %	1997	1998	1999	2000	00/99 %
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total fruit UE	:	:	:	:	:	:	:	:	:	:	:	20476	:	:	:
Belgium	17	17	18	18	-0,9	31800	36100	43000	44900	4,4	540	614	760	787	3,4
Denmark	7	7	7	:	:	7300	73000	7000	:	:	51	51	51	:	:
Germany	:	:	:	:	:	:	:	:	:	:	:	1460	:	:	:
Greece	280	280	:	:	:	4400	5000	:	:	:	1241	1404	2078	:	:
Spain	1144	1130	1146	:	:	4400	3900	4400	:	:	4983	4419	5097	:	:
France	221	215	213	212	-0,4	15900	14000	17400	17300	-0,9	3522	3004	3708	3681	-0,7
Ireland	:	:	:	:	:	:	:	:	:	:	17	14	17	17	0,0
Italy	:	:	:	:	:	:	:	:	:	:	8960	9303	:	:	:
Luxembur g	1	2	:	:	:	6000	1800	:	:	:	6	4	5	6	24,1
Holland	25	25	25	23	-5,8	24000	28900	31400	31300	-0,2	599	717	771	725	-5,9
Austria	:	:	:	:	:	:	:	:	:	:	:	537	563	651	15,6
Portugal	175	178	175	:	:	5800	4100	:	:	:	1015	730	:	:	:
Finland	8	8	8	8	:	2000	1600	1800	2200	18,1	16	13	15	18	17,7
Sweden	6	6	5	:	:	5500	4800	6100	:	:	33	29	33	:	:
Great Britain	28	26	24	27	10,3	8200	11900	14100	11400	-19,4	230	306	343	305	-11,1

Sours: European Commission (Eurostat); Member states ; http://www.europa.eu.int/comm/agriculture/agrista/2001/table_en/en45.htm







Legend

a.	in bearing orchards	b.	apples
c.	pears	d.	plums
e.	peaches	f.	apricots
g.	cherries, morellos	h.	walnuts
i.	other species	j.	fruit bearing, bushes and shrubs
k.	strawberries	l.	seedlings
m.	orchard clearings	n.	preparing area
p.	orchards-new plantation	q.	young orchards
r.	young fruit bearing, bushes and shrubs	s.	young strawberries
t.	total fruit-growing patrimony	o.	total fruits
u.	total production	v.	agricultural area
x.	specification	1)	mean
2)	root-mean-square deviation	3)	the Pearson coefficient of variation (%)
4)	index 2000/1989 (%)	5)	average annual rate (%)
6)	index 1980/1938 (%)	9)	measure units
8)	correlation coefficient	α .	thousands hectares
β .	thousands pieces	ϕ .	thousands tons
y.	the proportion of the in growing orchards from the agricultural area		
7)	the species structure of the total fruit-growing patrimony		

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Authors:

Mihaela Jaradat - "Bogdan Vodă" University, Faculty of Economics Sciences, city of Cluj Napoca, Romania

Florin Urs - "Bogdan Vodă" University, Faculty of Economics Sciences, city
of Cluj Napoca, Romania, E-mail: ubvcluj@ecosoft.ro

Sabina Funar - University of Agriculture Sciences and Veterinary Medicine,
city of Cluj Napoca, Romania E-mail: Sabinaf@email.ro